TEC-0087

19970417 059

Bibliography of In-House and Contract Reports, Supplement 20

Jean R. Diaz

October 1996

U.S. Army Corps of Engineers
Topographic Engineering Center
7701 Telegraph Road
Alexandria, Virginia 22315-3864

US Army Corps
of Engineers
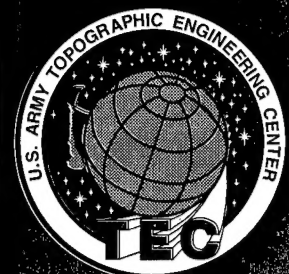Topographic
Engineering Center

T
E
C

DTIC QUALITY INSPECTED 1

REPORT DOCUMENTATION PAGE

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE October 1996	3. REPORT TYPE AND DATES COVERED Bibliography Oct. 1994 - Oct. 1996

4. TITLE AND SUBTITLE

Bibliography of In-House and Contract Reports,
   Supplement 20

5. FUNDING NUMBERS

6. AUTHOR(S)

Jean R. Diaz

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

U.S. Army Topographic Engineering Center
7701 Telegraph Road
Alexandria, VA 22315-3864

8. PERFORMING ORGANIZATION REPORT NUMBER

TEC-0087

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

19. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This is Supplement 20 to the TEC Bibliography of In-House and Contract Reports. This supplement provides author and title indexes, abstracts, and AD numbers for the 1994 through 1996 additions to the continuing bibliography. It also contains a complete title index designed to be used in conjunction with the 20 published bibliographies and refers to them by year and number.

14. SUBJECT TERMS
Bibliography
Scientific Reports

15. NUMBER OF PAGES
96

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED

TABLE OF CONTENTS

PREFACE

This is Supplement 20 to the report titled, "Bibliography of In-House and Contract Reports" AD-877 653L; Supplement 1, AD-890 066L; Supplement 2, AD-905 548L; Supplement 3, AD-B005 275L; Supplement 4, AD-B010 642L; Supplement 5, AD-B019 966L; Supplement 6, AD-055 468; Supplement 7, AD-A068 744; Supplement 8, AD-A084 111; Supplement 9, AD-A099 803; Supplement 10, AD-A113 006; Supplement 11, AD-A128 400; Supplement 12, AD-A141 778; Supplement 13, AD-A160 607; Supplement 14, AD-A173 750; Supplement 15, AD-A195 953; Supplement 16, AD-A215 154; Supplement 17, AD-A252 543; Supplement 18, AD-A265 475; and Supplement 19, AD-A295 530. It is a continuing bibliography of reports prepared by and for the U.S. Army Topographic Engineering Center, Alexandria, Virginia. This bibliography includes reports that were published from 31 October 1994 through 1 October 1996.

Reports with AD numbers can be purchased by Department of Defense agencies from the Defense Technical Information Center; other agencies and individuals can purchase copies from the National Technical Information Service, Springfield, Virginia 22161-2171. Reports with a "B" in the AD number are limited in distribution to U.S. Government agencies unless permission for release is granted from the controlling office.

Colonel Robert F. Kirby was the Commander and Acting Director of the Topographic Engineering Center at the time of publication.

TEC-0059   AD A296 595

AN INVESTIGATION OF KERNELS FOR SHADING
OF ELEVATION DATA
May 1995

Michael M. McDonnell

Keywords: Terrain Visualization, Elevation, Shaded Relief, Terrain Display, Geographic Data

This report examines the results of enhancing displays of an elevation array by using mathematical shading. The variable examined in this report is the shape of the primitive region by which shading is calculated. This primitive region is called a kernel. Three kernels are examined: triangles, quadrilaterals (actually squares), and a hybrid shape that seemed as though it might have fewer artifacts. The result is that shaded quadrilaterals seem to be more isotrophic and have fewer artifacts than the other shapes examined. Shading using quadrilateral kernels also is the easiest to calculate. All shading was done using the Gouraud technique.

TEC-0060   AD B195 984L

DECISION AID FOR INTEGRATED AIR DEFENSE PLANNING
October 1994

Richard Vargus
Terry Dueck

Systems Control Technology, Inc.   DACA76-91-C-0022

Keywords: Defense, Computer-Aided, Modeling, Weapons

Technological sophistication of modern air defense weapons systems, and plans for integrating existing and future SAM/ATM systems, have created a need for theater air defense mission planning systems to aid in the air defense planning process. These systems focus on providing the air defense planner with tools to rapidly and intelligently respond to the dynamics of the battlefield environment. The objective of the Air Defense Command and Control Systems (ADCCS) office is to create an interoperable network of systems that provides force level and functional commanders at corps level and below with the means to synchronize the forces. The development of tactical decision aids designed to aid the planner in creating an effective air defense is well within this area of interest.

VISION-BASED NAVIGATION AND RECOGNITION, SECOND ANNUAL REPORT
June 1995

Azriel Rosenfeld

University of Maryland

This report summarizes image understanding research dealing with many aspects of both navigation and recognition. This research has dealt with the following ten areas: (a) Parallel algorithms, (b) Invariant properties, (c) Image registration, (d) 3-D recovery, (e) Motion analysis, (f) Vision-based navigation, (g) Function-based recognition, (h) Face recognition, and (i) Document understanding. The work done in these areas is summarized in Sections 2-10 of this report. Further details about this work can be found in 12 technical reports issued on the Contract during the period April 1993 - March 1994. A bibliography of these reports is given in Section 11 of this report; the numbers in brackets in Sections 2-10 refer to this list.

A SYSTEM FOR AUTOMATED SIGHT MODEL ACQUISITION AND EXTENSION - RADIUS
June 1995

Robert Collins
Edward Riseman
Allen Hanson

University of Massachusetts

The goal of the Research and Development for Image Understanding Systems (RADIUS) project is to develop image understanding (IU) algorithms that support model-based aerial photo interpretation. This report, funded under a 3-year contract to develop algorithms for automated geometric sight modeling, describes research activities performed during the first year, October 1992 through October 1993.

TEC-0063   AD A302 492

THE ALBE GRIDDED VISIBILITY MODEL
May 1995

Vernon Stoltz

Keywords: Visibility, Line-of-Sight, Tactical Decision Aid, Elevation, Digital Terrain

The AirLand Battlefield Environment (ALBE) visibility model provides a new method of calculating Line-of-Sight visibility products derived from digital terrain elevation data. This new method uses a gridded raster approach rather than the historical vector approach. The basic principles and assumptions behind the model are discussed, starting with the advantages and disadvantages of using the gridded versus a vector approach. New methods devised to handle the gridded approach are discussed, including how to determine the grid cell resolution, the spacing between individual radials, and a detailed look at determining the spacing between individual points along a radial. A new method that uses a unique step size for each individual radial is described in detail. Other features covered are the earth's curvature, the inclusion of vegetation data, the visual acuity, and an elevation matrix form to help select a precise observer location. Finally, other closely related models that are based on the basic visibility model are discussed, including How High to Visibility, Radio Frequency Loss, Visibility Probability, Line-of-Sight for Obstacles, Aerial Detection, and Helicopter Approach Zones.

TEC-0064   AD A296 398

RADIUS: MODEL-BASED OPTIMIZATION
July 1995

Thomas M. Strat, Sr.
Lynn H. Quam, Sr.
Pascal V. Fua

SRI International   DACA76-92-C-0034

Keywords: Computer Vision, Aerial Image Analysis, RADIUS, Optimization, Snakes

The construction and use of 3-D models of military and industrial sites will allow revolutionary advances in the speed, confidence, and range of analytical techniques with which an Image Analyst (IA) develops and reports intelligence information. This SRI research project, in support of the RADIUS Program, seeks to increase the speed and accuracy with which site models can be constructed from current imagery by developing a new family of image understanding (IU) techniques, and by developing a novel way for an IA to employ them.

SCALABLE PROCESSING FOR DISTRIBUTED SIMULATION
AND SCENE GENERATION
July 1995

Brahm A. Rhodes
Steve D. Bronson

Onyx Sciences Corporation

This report details the results of researching and evaluating massively parallel architectures and visualization techniques. The main focus of this project was to evaluate and determine the potential of parallel computing systems for visual simulation applications, such as distributed interactive simulation, scene generation, visualization and others. This report summarizes results of our performance tests; describes scenarios and architectures that exploit parallel processors for visual simulation applications; discusses the state of the parallel computing industry; and presents recommendations for further research and development. Furthermore, this document describes a prototype toolkit to explore various options for using parallel processors for visual simulation.

DEVELOPMENT OF A STATISTICAL METHOD FOR THREE-DIMENSIONAL TERRAIN ELEVATION ERROR ANALYSIS, PHASE II
July 1995

David J. Dermody
Gary M. Wrap

TRIFID Corporation

Digital Terrain Elevation Data (DTED) has been produced by the Defense Mapping Agency (DMA) since 1974 as one of two primary data components of the Digital Landmass System (DLMS) Data Base. Typically, the DoD user is not familiar with the error in the DTED because of the specification limitations, the materials used in DTED production, and the production processes employed in the generation of DTED. Also, the user may be unaware of existing and conceptual methodologies for the accuracy evaluation of DTED. This unawareness of DTED limitations may lead to critical errors in the tactical decision making process. This report examines the effect of these accuracy limitations through error propagation in five tactical applications: Radial Terrain Masked Area plots, Incoming Target Acquisition, Flight Line Masking, Cross-Country Mobility, and Volume Computation. To support this error propagation, techniques were developed to evaluate DTED in the absence of DMA accuracy data to determine the likely production method. The evaluation of several DTED cells was performed against a variety of control sources to provide artificial intelligence used to access DTED cells in the tactical applications.

SPECTRAL SIGNATURES OF WETLANDS PLANTS (350-990nm)
August 1995

John E. Anderson

Field spectral reflectance measurements (350-900nm) were collected on select coastal and freshwater wetland plant canopies during the 1994 growing season. In this report, the author catalogues the signatures obtained for tidal and non-tidal specimens. This is the first report in an overall compendium of wetland plant signatures. In addition, this reference includes algal biomass and soil signatures.

PASSIVE RECOVERY OF SCENE GEOMETRY FOR
AN UNMANNED GROUND VEHICLE
September 1995

Robert C. Bolles
Martin A. Fischler

SRI International   DACA76-92-C-0003

The goal of this project was to develop techniques for constructing 3-D descriptions of outdoor scenes to support the navigational needs of an Unmanned Ground Vehicle (UGV), operating both during the day and at night. In this report we describe our progress in four areas: Stereo Evaluation—We performed an in-depth evaluation of three representative stereo techniques by analyzing the results on 49 stereo pairs; Stereo Sketch—We developed a high-level representation of an outdoor scene, which we call a "scene sketch," that can describe the semantic, as well as geometric properties of a 3-D scene; Spatiotemporal Filtering—We developed a technique for increasing the resolution and robustness of passive range sensors by integrating stereo and motion analysis; FLIR Stereo—We demonstrated the effectiveness of stereo analysis applied to infrared data, which makes passive night driving possible.

TEC-0070

TASK-DRIVEN ACTIVE VISION FOR
SECURITY AND SURVEILLANCE
January 1996

H. Keith Nishihara
Stanley J. Rosenschein
Phil Kahn
J. Brian Burns
Matthew Turk

Teleos Research

Teleos is developing and integrating active vision technology with intelligent, domain-specific control strategies to provide real-time visual detection, characterization, and tracking of objects in the security and surveillance domain. Work to date has focused on theoretical studies and experimentation in the areas of attentional mechanisms, figure-ground discrimination, recognition, and active sensor mechanisms to support visual surveillance. The primary research focus is on the detection and tracking of humans in a monitored area. This report describes new results in blob-based shape recognition; the use of oriented texture blobs for face-finding; and stereo-based real-time figure-ground discrimination techniques.

TEC-0071

AD A317 316

GPS TIDES: A PROJECT TO DETERMINE TIDAL DATUMS WITH THE GLOBAL POSITIONING SYSTEM
August 1995

Stephen R. DeLoach

Keywords: Global Positioning System (GPS), OTF Ambiguity Resolution, Tidal Datums, Tide Gauges

The recent development of On-the-Fly (OTF) ambiguity resolution techniques with Global Positioning System (GPS) observations has created a powerful tool for the study of dynamic time series, such as tidal analysis or the study of water level heights. For this project a GPS receiver was successfully operated on board a Canadian Coast Guard navigation buoy. Ten days of data, at a one-second sampling interval, were collected at a station in the open waters of the Bay of Fundy, followed by 10 days from an inshore mooring. The buoy data were transmitted in real time to a reference station on shore where antenna heights were computed in real time. Subsequent processing reduced the 1-Hz antenna height series to a 15-minute water surface height series for comparison to two nearby "conventional" gauges. These were the Saint John Harbour permanent gauge and a temporary Socomar pressure gauge. Mean tide heights computed from the inshore data are all within 1 cm. The means, computed from the inshore series, differed by 20 cm between the buoy and the "conventional gauges," indicating a differential slope between the ware surface and the ellipsoid. In addition to the water surface measurements, about 20 days of GPS data were collected from a static baseline to characterize the performance of the OTF GPS system, without the influence of a moving platform. From the 20 days of data, 97 percent is within 3 cm of truth, while the mean daily heights are about 0.3 cm below the truth. This project has demonstrated that the "GPS buoy" is a viable method of tidal datum determination and it should be possible to use the ellipsoid as the basis for water surface datums.

IFSAR DATA FOR AUTOMATED RAPID MAPPING—PHASE I SBIR
October 1995

Vexel Corporation   DACA76-95-C-0007

This report summarizes work in the area of feature-based classification of interferometric synthetic aperture radar (IFSAR) imagery. This work will support the Army's goal of doing "rapid mapping." The potential of the new airborne IFSAR mapping instrument designed, built, and operated by the Environmental Research Institute of Michigan (ERIM) also is evaluated. This IFSAR system is tasked with high-resolution mapping. The focus of the Phase I task was to use all three of these data sets to extract map elements. These elements include land-use polygons, elevation contours, hydrology networks, transportation networks, buildings, and other manmade structures. This report shows that the IFSAR data are suitable for distinguishing major categories of land use, such as urban areas, forests, fields, open water, and swamps. Major road networks also can be vectorized automatically from the data. A significant result is a new technique that was developed that enables extraction of the "bald earth" elevation from the IFSAR elevation provided. This allows further extraction of features on the "bald earth," such as buildings, electric power line towers, and tree stands. Example map products illustrating these results are provided in this report.

COMPUTER AUTOMATED IMAGE CLASSIFICATION
November 1995

K. O'Rourke

Pacific-Sierra Research Corporation

The primary objective of the research and development was to achieve classification and feature extraction from high-resolution digital terrain elevation (DTE) data and corresponding fine resolution SAR imagery generated from interferometric synthetic aperture radar (IFSAR) data. The report contains six sections. Section 1 contains a project summary that describes the objectives, approach, results, and conclusions of the Phase I project. Section 2 presents a discussion of future research and development recommended for a Phase II SBIR program. Section 3 presents details on the image data used for developing the image classification algorithms. Section 4 describes details of neural network (NN) algorithms investigated for image classification. Section 5 describes an image processing technique for extracting a specific feature type (water drainage systems) from high-resolution digital terrain elevation (DTE) data. Section 6 presents the technical results obtained during the Phase I project.

DIS TERRAIN DATA FORMAT STUDY
November 1995

Deb Herman
Scott Barrett
Tim Langevin
Kevin Trott
Audrey Copperwheat

PAR Government Systems Corporation   DACA76-90-D-0001

The purpose of this report is to provide descriptions and comparisons of existing and developing standard Digital Topographic Data (DTD) and Distributed Interactive Simulation (DIS) terrain data exchange formats in the context of general DIS community requirements for terrain data. An analysis of these formats was made to determine each format's key features and its ability to support the DIS community. Each format was examined relative to the support that it provides for each of the following key characteristics: metadata; topology, ranging from Level 0 (none) to Level 3 (full topology support); spatial organization and indexing; feature and attribute coding; text; composite features; integration and/or layering; multiple levels of detail; 3-D data; 3-D model behaviors; and, coordinate systems and datums. The results of this study identified key spatial data modeling and representation concepts provided by these formats which should be included in future synthetic environment data interchange standards.

REPRESENTATION, MODELING AND RECOGNITION OF OUTDOOR SCENES
January 1996

Martin A. Fischler
Robert C. Bolles

SRI International

Keywords: Machine Vision, Automated Scene Analysis, Object Recognition, Terrain Modeling

The goal of this project is to advance the state-of-the-art in scene interpretation for autonomous systems that operate in natural terrain. In particular, techniques are being developed for representing knowledge about complex cultural and natural environments so that a computer vision system can successfully plan, navigate, recognize and manipulate objects, and answer questions or make decisions relevant to this knowledge. The results to date include the development of new representations for rapidly modeling terrain from multiple images—including 3-D hexagonal surface meshes and "particle-based" 3-D modeling primitives that allow a robotic system to incrementally build a complete geometric model of its environment. We have also extended and improved our set of object recognition primitives to allow reliable labeling of such scene attributes and components as color, texture, shadows, and a variety of linear structures (skyline, ridgelines, roads, etc.). The most recent results are detailed in four published papers included as appendices to this report.

IMAGE UNDERSTANDING ENVIRONMENT FOR ARPA-SUPPORTED RESEARCH AND APPLICATIONS
January 1996

Douglas Morgan

Booz, Allen and Hamilton, Inc.

Keywords: Image Understanding, Environments, Object-Oriented Specification

This report documents the design and development of a Vision Environment system and contributions to the design of the ARPA Image Understanding Environment (IUE). The primary contributions are to an object-oriented specification of a hierarchy of classes for image understanding applications. Analyses of implementation issues in both the C++ and Common Lisp languages also are presented.

RESEARCH IN MODEL-BASED CHANGE DETECTION AND
SITE MODEL UPDATING
January 1996

R. Nevatia

University of Southern California

Change detection is perhaps the most important task in the process of photo interpretation, and an ideal one to demonstrate the effectiveness of the site modeling exploitation (SME) approach that has been adopted for the RADIUS program. Change detection is a tedious task as it requires careful comparison of images (and their models) taken at different times under possible varying conditions. The task of change detection consists of comparing a new image of a site (or a collection of images), to the information contained in the folder for that site. The information in the site folder may consist of one or more previous images and results of previous analyses on these images. We believe that even partial automation of this task will greatly increase an analyst's productivity and possibly enhance the reliability of the results.

EL NINO—ITS FAR-REACHING ENVIRONMENTAL EFFECTS ON ARMY
TACTICAL DECISION AIDS
March 1996

John Neander

El Nino. A series of benign changes in pressure and temperature over Darwin, Australia and Tahiti often results in significant changes in oceanographic and atmospheric patterns around the world. These, in turn, can produce short-term weather changes that impact vested interests of the United States on the world's political and military arenas. At the onset of an El Nino, the oceanographic changes are complemented by atmospheric changes that result in abrupt weather pattern reversals in a seasonal and a geographic context. The two weather extremes to consider from an El Nino event are droughts and floods. To know the likely implications of an El Nino event in advance will allow strategic and logistic planners to more accurately decide what type of weapons and support material will work best for the United States in the various world theaters.

AN ASSESSMENT OF THE HORIZONTAL ACCURACY OF
INTERIM TERRAIN DATA
April 1996

Louis Fatale
Jeffrey Messmore
James Ackeret

Within the U.S. Army and throughout the private sector, the accuracy of Digital Topographic Data (DTD) is often taken for granted. Users assume terrain data to be accurate merely because of its digital nature. This report describes a study that was undertaken to determine the horizontal accuracy of Interim Terrain Data (ITD), a 1:50,000-scale terrain analysis data base. ITD is composed of vector features and associated attributes representing land cover characteristics. It is produced by the Defense Mapping Agency (DMA) and provided to the U.S. Army to support near-term requirements on an interim basis until more standardized data are available. Because of its interim nature, ITD may be digitized from hard-copy source ("carto-controlled") or produced solely from photography ("photo-controlled"). No definitive accuracy statement is provided with the data. This study was initiated in 1994 with the collection of ground coordinates for more than 400 selected ITD features. Each feature was located in the field using a Precise Lightweight Global Positioning System Receiver (PLGR) in the Precise Positioning Service (PPS) mode (10-meter horizontal accuracy). Universal Transverse Mercator (UTM) coordinates obtained from the PLGR were annotated for each feature. The UTM coordinates for coincident features in the ITD digital files were subsequently extracted by GIS query to compare statistically the digital data with the field data, calculate the offsets, and determine the horizontal accuracy of the ITD. The potential accuracy differences between the carto- and photo-controlled ITD and the variability of natural vs. man-made features also are discussed.

THE UMASS RADIUS PROJECT—YEAR 2
October 1996

Robert Collins
Allen Hanson
Edward Riseman

University of Massachusetts

A set of image understanding (IU) algorithms for automated site model acquisition and extension are being developed at the University of Massachusetts. In 1995, a building extraction system was implemented to acquire flat roofed, rectilinear building models from multiple, monocular images. This system hypothesizes building rooftops from a single image, then searches for supporting evidence in other views and determines the precise 3-D shape and location of each building via multi-image triangulation. Projective mapping of image intensity information onto these polyhedral building models results in a realistic site model that can be rendered using virtual "fly-through" graphics. To perform model extension, a prior site model is registered to new images, and building model acquisition procedures are focused on previously unmodeled areas. In an operational scenario, this process would be repeated as new images become available, gradually accumulating evidence over time to make the site model data base more complete and accurate. Model-to-image registration techniques also are presented that can be used to automatically determine model-based local corrections to the resected camera parameters provided with each image.

PERSONAL NAVIGATION AND REPORTING, PHASE II
April 1996

Robert W. Levi
Tom Judd

Point Research Corporation   DACA76-94-C-0005

This report describes the development of a prototype Personal Navigation and Reporting System (PNRS). The purpose of the PNRS was to investigate and develop a self-contained navigation system for dismounted soldiers. The system would be based on a magnetic compass, altimeter, and a personal distance measuring device. Data from the navigation system would be used as a supplement to GPS position information. The project was achieved in two phases. The feasibility and general approach were developed in Phase I. Prototype hardware and software were developed and tested during Phase II.

THREE-DIMENSIONAL MODELING STATION, PHASE II
October 1996

Lei Zhang
Javier F. Maida
Gregory D. James

Mandex, Inc.

DACA76-93-C-0027

The objective of this Phase II SBIR project was to provide the U.S. Army Topographic Engineering Center (TEC) with a 3-D Modeling Station composed of hardware, software, and development tools, and to create and populate a data base with models of suitable features found in Defense Mapping Agency's (DMA) Interim Terrain Data (ITD) set, at an appropriate level of detail. A low-end DOS-based system and a high-end UNIX-based system were configured to meet the varied requirements of simulator data base development, and more than 160 3-D feature models were created using the modeling stations. These models represent terrain features, both natural and man-made, defined in the DMA's ITD. Models are available in AutoCAD DXF, IRIS Open Inventor (IV), and Wavefront OBJ formats. A relational data base was designed and created to store the model information, and serves as a standard model library. A DBMS system with the X-Window/Motif graphical user interface was developed to provide tools for model data manipulation and management. Dynamic model placement tools were developed for placing models into simulation scenes. Using these tools, the following three feature types can be placed: point, linear, and area.

A STUDY OF ARMY REQUIREMENTS FOR MAPPING, CHARTING, AND GEODESY/DIGITAL TOPOGRAPHIC DATA
July 1996

Thomas E. Lee   William L. Othling, Jr.
Steven M. DiSilvio   F. Leslie Speir
Denise Hovanec, TEC

Science Applications International Corporation   DACA76-90-D-0002

The Defense Mapping Agency (DMA) is beginning production of the digital land combat products required by the U.S. Army. Requirements for these products were initially documented and provided to DMA in the 1984 "Army Digital Topographic Data Requirements" document. At the request of the Deputy Chief of Staff of the Army for Intelligence, the U.S. Army Topographic Engineering Center (TEC) completed another requirements study intended to revalidate previously stated requirements, and assess the ability of planned and current products to meet these requirements. This report documents new feature and attribute requirements and addresses scale and resolution requirements for the 58 Army users surveyed.

A HISTORY UPDATE OF THE U.S. ARMY ENGINEER TOPOGRAPHIC LABORATORIES, FORT BELVOIR, VIRGINIA, 1984-1988
August 1994

Robert Hellman

Keywords: ETL History, Research and Development, Mapping, Surveying

This document presents the historical changes and growth of the U.S. Army Engineer Topographic Laboratories from 1984 to 1988. It also provides a general description of the research and development programs during this period.

HANDBOOK FOR TRANSFORMATION OF DATUMS, PROJECTIONS, GRIDS AND COMMON COORDINATE SYSTEMS
January 1996

Frederick Gloeckler
Richard Joy
Justin Simpson
Daniel Specht

Keywords: Cartography, Datums, Projections, Geodesy, Coordinates

This document provides Army organizations and agencies with general guidance on selecting the appropriate methods for shifting between local geodetic datums and the World Geodetic System (WGS), and for converting Cartesian and map projection coordinates to and from geodetic coordinates. This guidance is provided to aid the Army community in selecting datum shift algorithms, in developing, selecting, and maintaining software using these algorithms, and in implementing this software to support operational units. Equations are furnished for map projections and datums commonly used within the Army, and references are provided for other, less commonly encountered, map projections and datums.

PAPERS

ACKERET, James, See **FATALE.**

ANDERSON, John, "Spectral Reflectance of Wetland Plants," National Interagency Workshop on Wetlands, 3-7 Apr 95, New Orleans, LA.

ANDERSON, John, See **GETLEIN.**

ANDERSON, John, See **EASTES.**

BARR, Samuel, "Special Applications of Spectral Sensing," ISSSR, 26 Nov-1 Dec 95, Melbourne, Australia.

BENTON, John, et al., "Tactical Route Planning: New Algorithms for Decomposing the Map," IEEE International Conference on Tools for AI, 6-8 Nov 95, Washington, D.C.

BERGMEN, Kenneth, "On the Application of Interferometric Synthetic Aperture Radar (IFSAR) Products for Rapid Mapping," International Geoscience and Remote Sensing Symposium, 27-31 May 96, Lincoln. NE.

BOGE, Walter, "U.S. Army Topographic Engineering Center (TEC) Overview," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

BOSCH, Edward, "The Effects Different Neural Network Architectures have on the Exploitation of Hyperspectral Data," ISSSR, 26 Nov-1 Dec 95, Melbourne, Australia.

BOSCH, Edward, and SHINE, James, "Evolutionary Experiments to Optimize Hidden Layers for Hyperspectral Imagery Classification," World Congress on Neural Networks, Sep 96, San Diego, CA.

CATANIA, Luke, and LIN, Tai-Ti, "The Joint Precision Strike Integration and Evaluation Center," 20th Army Science Conference, 25-27 June 96, Norfolk, VA.

CHEN, Pi-Fuay, and TRAN, Tho Cong, "Edge Detection and Image Smoothing Using Neural Networks," Proceedings of the 1995 World Congress on Neural Networks, Washington, D.C.

CORL, Phyllis, See **RINKER.**

DELOACH, Stephen, "An International Vertical Reference for Hydrography," 10th Hydrographic Society Symposium, 24-26 Sep 96, Rotterdam, Netherlands.

DELOACH, Stephen, "Delineation of Tidal Datums and Water Surface Slopes with the GPS," *Sea Technology,* March 1995, Vol. 36, No. 3.

DELOACH, Stephen, "GPS Tides and Water Levels," 10th Hydrographic Society Symposium, 24-26 Sep 96, Rotterdam, The Netherlands.

PAPERS (continued)

DELOACH, Stephen, "Why On-the-Fly? *GPS World Magazine*, May 1995, Vol. 6, No. 5.

DELOACH, Stephen, and **OIMOEN**, Daniel, "The Many Facets of GPS," 20th Army Science Conference, 25-27 June 96, Norfolk, VA.

EASTES, John, **KRUSINGER**, Alan and **ANDERSON**, John, "Spectral and Thermal Measurements with a Field Portable Infrared Emmitance Spectrometer: Implications for Diverse Environmental Monitoring and Research," ISSSR, 26 Nov-1 Dec 95, Melbourne, Australia.

EHLEN, Judy, "Analysis of Fracture Patterns Using Remote Sensing," *Geological Society of America Abstracts with Programs*, vol. 26, 1994.

EHLEN, Judy, "Classification of Dartmoor Tors," In *Rock Weathering and Landform Evolution*, **D.A. Robinson** and **R.B.G. Williams,** John Wiley and Sons, 1994.

EHLEN, Judy, et al. "Fracture Recognition in Digital Imagery," *Proceedings of the 35th U.S. Symposium on Rock Mechanics*, 1995, Brookfield, VT.

EHLEN, Judy, "Granite Weathering—A Scale Invariant Phenomenon?" *Geological Society of America Abstracts with Program*, vol. 28, 1996.

EHLEN, Judy, " Predicting Fracture Characteristics Using Three-Dimensional Modeling," 1st International Conference on Geocomputation, 17-19 Sep 96, Leeds, England.

FATALE, Louis, **MESSMORE**, Jeffrey, and **ACKERET**, James, "An Assessment of the Horizontal Accuracy of Interim Terrain Data," *Proceedings of the Second International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences*, 21-23 May 96, Fort Collins, CO.

FRODGE, Sally, "Performance of the Real Time On-the-Fly GPS Positioning System on Board a Dredge," Proceedings of the Institute of Navigation (ION), 18-20 Jan 95, Anaheim, CA.

GETLEIN, Stephen, **SLOCUM**, Kevin, and **ANDERSON**, John, "Off-the-Shelf in the Field: Innovative Technologies for Natural Resource Management," Department of Defense Environmental Technology Workshop, 22-24 May 95, Hershey, PA.

GETLEIN, Stephen, **SLOCUM**, Kevin, and **ANDERSON**, John, "Integrated Vegetation Data Collection," Department of Defense Environmental Technology Workshop, 22-24 May 95, Hershey, PA.

GRAFF, Brian, "Inferring Bridges from Digital Cartographic Sources Using Arc/Info," Environmental Systems Research Institute (ESRI), May 96, Redlands, CA.

HANSEN, John and **JOHNSON**, Peter, "Interferometric Synthetic Aperture Radar Applications to Crisis Support," ISSSR, 26 Nov-1 Dec 95, Melbourne, Australia.

PAPERS (continued)

HEVENOR, Richard, "Extraction of Water Regions from Radar Imagery Using a Discrete Biorthogonal Wavelet Transform," 1995 SPIE OE/Aerospace Sensing and Dual Use Photonics Symposium, 17-21 Apr 95, Orlando, FL.

HOVANEC, Denise, "1995 Army DTD Requirements Study," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

JOHNSON, Peter, See HANSON.

JOY, Richard, "MC&G Software Reuse Science and Technology Objectives," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

KARPISCAK, John, III, "Enabling Technologies for the Warfighter," 20th Army Science Conference, 25-27 June 96, Norfolk, VA.

KOKLAUNER, Karl, See TURNER.

KRUSINGER, Alan, See EASTES.

LIN, Tai-Ti, See CATANIA.

MESSMORE, Jeffrey, See FATALE.

OIMOEN, Daniel, "U.S. Army GPS Survey—Capabilities and Limitations," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

RAND, Robert, "Exploitation of Hyperspectral Data Using Discriminate and Constrained Subpixel Demixing to Perform Automated Material Identification," ISSSR, 26 Nov - 1 Dec 95, Melbourne, Australia.

RINKER, Jack, and CORL, Phyllis, "A Hypermedia Terrain Data Base for Desert Operations," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

RYDER, William, See VOYADGIS.

SANTORO, Mary Pat, "Viewgraphs on TEC/OD-IG Role in the Army MSI Program," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

SHINE, James, "A Genetic Algorithm Approach for Configuring Backpropagation Architecture for Imagery Classification," World Congress on Neural Networks (WCNN '95), 17-21 July 1995, Washington, D.C.

SHINE, James, See BOSCH.

PAPERS (continued)

SLAMA, Michael, and **FLY**, Brian, "Maps Hybrid: Formal Qualification Performance Test Results," 1996 Position Location and Navigation Symposium, April 1996.

STOLTZ, Vernon, TEC, and **SCHMIDT**, Eric, TASC, "Weather in Distributed Interactive Simulations (WINDS)," Cloud Impacts on DOD Operations and Systems (CIDOS), 24-26 Oct 95, Lexington, MA.

TRAN, Tho Cong, See **CHEN**, Pi-Fuay.

TURNER, Jeffrey, and **KOKLAUNER**, Karl, "Dynamic Environment and Terrain in a Virtual World," 20th Army Science Conference, 25-27 June 96, Norfolk, VA.

VOYADGIS, Demetra, and **RYDER**, William, "Measuring the Performance of Ground Slope Generation," Environmental Systems Research Institute (ESRI), May 96, Redlands, CA.

WEIPERT, Mark, "Army Centralized Digital Terrain Data Repository," First Consolidated Army Topographic, Terrain Analysis and Multispectral Imagery Conference, 13-15 Nov 95, Fort Belvoir, VA.

TITLES

TITLES (continued)

CORPORATE AUTHORS

PERSONAL AUTHORS

AD Numbers

APPENDIX — TITLES

1953 - 1996

TITLE	REPORT NO.	YEAR
Accuracy of Cartometric Data	AD 810 496	1966
Accurate Emphemeris Time Determination and Geocentric Stations Position from Photographs of the Moon Against Stellar Background	ETL-RN-72-4	1972
Acousto-Optic Technology for Topographic Feature Extraction and Image Analysis	ETL-0256	1981
Adjunct Development Test II (DT II) of Position and Azimuth Determining System AN/USQ-70	ETL-0217	1980
Acquisition and Evaluation of Thermal Standard Data	ETL-0218	1980
ADRIES Prototype System Development Program (1986-1990)	ETL-0577	1990
Advanced Continuous Tone Plate and Process Compatible with Present Military Lithographic Reproduction Equipment and Practices	ETL-0056	1975
Advanced Digital Radar Imagery Exploitation Robust System (ADRIES) Annual Report	ETL-0578	1990
Advanced Digital Radar Imagery Exploitation System (ADRIES) Final Report (1986-1990)	ETL-0579	1990
Advanced Edit System	ETL-0295	1983
Advanced Development Prototype (ADP) for the Quick Response Multicolor Printer (QRMP)	ETL-0392	1987
Advanced Feature Symbolization for Three-Dimensional Views	ETL-0223	1980
Advanced Methods for the Calibration of Metric Cameras	AD 706 870	1968
Advanced Radar Topographic Application	ETL-CR-73-2	1973
Advanced Satellite Hardware/Software System Study	ETL-0225	1980
Advanced Satellite Tracking Instrumentation Study	AD 882 2546	1968
Advanced Study of a Position and Azimuth Determining System (Final)	AD 844 930L	1968
Advanced Study of a Position and Azimuth Determining System (Addendum)	AD 848 369L	1968
Advanced Study of a Position and Azimuth Determining System (Supplement)	AD 861 446L	1969
Advanced Techniques for the Reduction of Geodetic SECOR Observation (Final)	AD 640 238	1966
Advanced Techniques for the Reduction of Geodetic SECOR Observation (Supplement)	AD 664 744	1967
Aerial Triangulation by Least Squares, Final Report	AD 140 062	1957
AGFA Contour Film	ETL-TR-73-1	1973
Airborne Positioning and Attitude Data Application Study, Phase I	AD 815 525L	1967
Airborne Positioning and Attitude Data Applications Study, Phase II	AD 815 526L	1967

Air Photo Analysis, Photo Interpretation Logic, and Feature Extraction	ETL-0329	1984
ALBE Gridded Visibility Model, The	TEC-0063	1995
Algorithms for Digital Terrain Data Modeling	ETL-0302	1982
All-Weather Mapping Contour Plotting Program		1965
Alternative Theories of Inference in Expert Systems for Image Analysis	ETL-0382	1985
Altimeter, Surveying, 4500 Meters, 2-Meter Divisions	1350-TR	1954
Analog Graphic Processing for 3-D Terrain Displays, Profiles, and Elevation Layer Tints	ETL-0026	1975
Analog to Digital Converter to Digital Magnetic Recorder Interface	ETL-CR-71-4	1971
Analysis and Development of Digital Mapping System Software	ETL-CR-74-5	1974
Analysis and Development of Image Statistics and Redundancy Removal	ETL-0239	1980
Analysis and Simulation of Discrete Digital Image Matching	ETL-0278	1981
Analysis and Test Results of a Gyrocompass With Reduced Susceptibility to Shock, Vibration, and Motion	ETL-0501	1988
Analysis and Tests of Environmental Effects on Gyrocompassing Accuracy	ETL-0378	1984
Analysis of Air Photo and Radar Imagery of Barro Colorado Island, Panama, An	ETL-0540	1989
Analysis of a Relaxation Scheme to Improve Terrain Elevation Data, An	ETL-0298	1982
Analysis of Edge Detection Algorithms on DIAL	ETL-0371	1985
Analysis of GEOS PC-1000 and SECOR Data	AD 882 165L	1967
Analysis of Interactive Image Cleansing Via Raster-Processing Techniques	ETL-0347	1983
Analysis of LANDSAT Systems for Cartographic and Terrain Information (Report No. 9 in the ETL Series on Remote Sensing)	ETL-0103	1977
Analysis of Multispectral Scanner Data for Location of Sand and Gravel Deposits	AD 705 673	1970
Analysis of Radar Calibration Data (Final)	AD 827 858L	1967
Analysis of Radar Calibration Data (Supplement)	AD 836 943L	1968
Analysis of SECOR Data — Vol. I	AD 865 488L	1968
Analysis of SECOR Data — Vol. II	AD 865 489L	1969
Analysis of the Max-Min Texture Measure, An	ETL-0280	1982
Analysis, Storage and Retrieval of Elevation Data with Applications to Improve Penetration	ETL-0179	1979
Analytic Aerotriangulation: Triplets and Sub-Blocks Including Use of Auxiliary Data	AD 631 072	1965
Analytical Aerial Triangulation	1510-TR	1958

TITLE	REPORT NO.	YEAR
Analytical Aerial Triangulation Error Analysis and Application of Compensating Equations to the General Block Triangulation and Adjustment Program (Interim)	AD 271 442	1961
Analytical Aerial Triangulation Error Analysis and Application of Compensating Equations to the General Block Triangulation and Adjustment Program (Final)	AD 401-689	1962
Analytical Aerial Triangulation with Large Computer (Analytical Simultaneous Block Triangulation Technique)	34-TR	1966
Analytical Aerial Triangulation with Small Computer	13-TR	1963
Analytical Aerotriangulation Using Triplets in Strips	AD 668 683	1965
Analytical Photogrammetric Position System (APPS)	ETL-TR-74-2	1973
Analytical Photogrammetric Position System (APPS) to Support the Field Army	ETL-TR-74-4	1974
An Investigation of Kernels for Shading of Elevation Data	TEC-0059	1995
Apparent Temperature and Emissivity of Natural Surfaces at Microwave Frequencies	AD 872 878L	1970
Appendix III Narrative Report for Geoscience Overlays		1968
Application of a Feature Selection Technique to Samples of High Resolution Synthetic Aperture Radar Imagery	ETL-0330	1983
Application of a Phase Comparison Radiolocation System to Distance and Position Measurement over Mountainous and Desert Terrain		1957
Application of Artificial Intelligence to Radar Image Understanding	ETL-0387	1985
Application of Biorthogonal Filter Functions to Pattern Recognition and Feature Extraction	ETL-0222	1980
Application of Coriolis Force to Geodetic Measurements	AD 477 136	1965
Application of Hierarchical Data Structures to Geographical Information Systems	ETL-0301	1982
Application of Hierarchical Data Structures to Geographical Information Systems (Phase II)	ETL-0337	1983
Application of Hierarchical Data Structures to Geographical Information Systems (Phase III)	ETL-0376	1984
Application of Hierarchical Data Structures to Geographical Information Systems (Phase IV)	ETL-0411	1985
Application of Inertial Techniques to Surveying	AD 805 156	1966
Application of Image Sensing Arrays to Metrology, Detection and Instrumentation	ETL-CR-71-6	1970

TITLE	REPORT NO.	YEAR
Application of Image Sensing Arrays to Metrology, Detection and Instrumentation	ETL-CR-72-5	1972
Application of Image Sensing Arrays to Metrology, Detection and Mapping, Interim	ETL-CR-74-9	1974
Application of LORAC to Precision Terrestrial Line-Length Measurement and Position Fixing	AD 232 015	no date
Application of Scalar Renormalization to the Scattering of Electromagnetic Waves from a Three-Dimensionally Inhomogeneous Medium with Strong Dielectric Fluctuations	ETL-0020	1975
Applications of Advanced Accelerometers to Surveying and Geodesy I	AD 429 324L	1963
Applications of Advanced Accelerometers to Surveying and Geodesy II	AD 439 969L	1964
Applying Photogrammetry to Real Time Collection of Digital Image Data	ETL-0275	1981
Approach to Model Formation Based on Formal Geometric Reasoning, An	ETL-0493	1988
Approach to the Evaluation of Strategies in Insurgency, An	AD 722 787	1968
APPS-IV Civil Works Data Extraction/Data Base Application Study (Phase I)	ETL-0310	1982
APPS-IV Civil Works Data Extraction/Data Base Application Study (Phase II)	ETL-0336	1983
APPS-IV Remote Sensing Applications Guide	ETL-0333	1983
ARK-1 Gyro Aiming Circle (Wild Heerbrugg Instruments, Inc.)	49-TR	1969
ARMIDOP/ZERO-DOP Positioning Technique	ETL-RN-71-2	1971
Army Tactical Terrain Data Requirements Forecast (FY87-FY93)	ETL-SR-1	1987
Army Terrain Information System	ETL-0050	1976
ARPA Unmanned Ground Vehicle Stereo Vision Program at Teleos Research: Annual Report	TEC-0034	1993
ARPA Unmanned Ground Vehicle Stereo Vision Program	TEC-0052	1994
Artifact Removal in Frequency Domain Compressed Imagery	ETL-0233	1980
Artillery Survey System, Phase 1— Study of Methods	AD 883 288L	1958
Aspects and Methods of Nonisotropic Land Navigation Error Control Including Consideration of Topography	ETL-RN-71-4	1971
Assessment of Inertial Technology for Gravity Survey Applications	ETL-0291-1	1982
Assessment of Means for Determining Deflection of the Vertical	ETL-0303	1982
Assessment of the Horizontal Accuracy of Interim Terrain Data, An	TEC-0081	1996

TITLE	REPORT NO.	YEAR
Assistant for Science and Technology Analyst (ASTA)	ETL-0570	1990
Associative Array Processing of Raster Scanned Data for Automated Cartography	ETL-0046	1976
Associative Array Processing of Raster Scanned Data for Automated Cartography II (Improved Resolution and Data Handling)	ETL-0132	1977
Associative Array Processing for Topographic Data Reduction	ETL-CR-74-1	1974
Associative Array Processing for Topographic Data Reduction, Final Report	ETL-CR-74-20	1974
Astrogeodetic-Inertial Methods for Vertical Deflection Determination	ETL-0414	1985
Astronomical Attachment Azimuth Determination, Reflecting, for Transit or Theodolite	1374-TR	1954
ATF-Hadego Photocompositor Photolettering Machine	1414-TR	1955
Atmospheric Refraction	TR-61-505	no date
Atmospheric Refraction for Satellite Photography	56-8B-1	1962
Autocorrelation of Control Points on 11-Band Multispectral Imagery	ETL-0473	1987
Autonomous Land Vehicle (ALV) Program - Seventh Quarterly Report, The	ETL-0496	1988
Approach to Model Formation Based on Formal Geometric Reasoning, Second Annual Report, An	ETL-0527	1989
Automated Classification of Basic-Level Terrain Features in Digital Elevation Models	TEC-0013	1992
Automated Extraction of Airport Runway Patterns From Radar Imagery	ETL-0567	1990
Automated Feature Attribute Accessing From Map Text	ETL-0517	1988
Automated Industrial Feature Extraction from Synthetic Aperture Radar Imagery	ETL-0459	1987
Automated Processing of Geographic Information in Image Data Forms	ETL-0114	1977
Automated Route Finder for Multiple Tank Columns	ETL-0480	1987
Automated SAR Change Detection for Combat Support Phase I	ETL-0574	1990
Automated Segmentation and Extraction of Area Terrain Features From Radar Imagery	ETL-0554	1990
Automated Software System for Updating Digital Terrain Databases From All-Source Imagery, Phase I SBIR	ETL-0584	1991
Automated Technique for Measuring Built-Up Urban Areas from Map Graphics through Analog Image Processing	ETL-0012	1975
Automatic Contour Digitizer (ACD)	ETL-ETR-71-2	1971

TITLE	REPORT NO.	YEAR
Automatic Contouring Instrumentation	1488-TR	1957
Automatic Control of Digital Stereo Correlation Methods	ETL-0356	1984
Automatic Correlation of USGS Digital Line Graph Geographic Features to GNIS Names Data	ETL-0426	1986
Automatic-electro Optical Satellite Triangulation System	RN-23	1967
Automatic Feature Extraction/Algorithm Testing	ETL-0410	1985
Automatic Feature Extraction: An Annotated Bibliography	ETL-0189	1979
Automatic Line Network Extraction From Aerial Imagery of Urban Areas Through Knowledge-Based Image Analysis	ETL-0568	1989
Automatic Map Compilation System	AD 277 456	1962
Automatic Point Marking Measuring and Recording Instrument	AD 610 044	1964
Automatic Point Transfer Instrument	AD 834 230L	1968
Automatic Reseau Measuring Equipment (ARME)	ETL-0099	1976
Automatic Stereo Perception of Aerial Photography by Means of Optical Correlation	AD 406 363	1962
Automatic Radar Feature Extraction System Using Descriptors	ETL-0533	1989
Automatic Type/Symbol-Placement Developments	ETL-TR-74-9	1975
Automation of Airborne Profile Recorder Data Reduction (Interim)	AD 805 562L	1966
Automation of Airborne Profile Recorder Data Reduction (Final)	AD 825 545L	1967
Autonomous Ground Vehicles: Control System Technology Development	ETL-0375	1984
Autonomous Land Vehicle	ETL-0413	1986
Autonomous Land Vehicle (ALV) Planning and Navigation System	ETL-0465	1987
Autonomous Land Vehicle (ALV) Program Phase II - First Quarterly Scientific and Technical Report, The	ETL-0515	1988
Autonomous Land Vehicle (ALV) Program Phase II - Second Quarterly Scientific and Technical Report, The	ETL-0526	1988
Autonomous Land Vehicle 1st Quarterly Report, The	ETL-0430	1986
Autonomous Land Vehicle 2nd Quarterly Report, The	ETL-0436	1986
Autonomous Land Vehicle (ALV) Program, Third Quarterly Report, The	ETL-0450	1986
Autonomous Land Vehicle (ALV) Program, Fourth Quarterly Report, The	ETL-0460	1987
Autonomous Land Vehicle (ALV) Program, Fifth Quarterly Report, The	ETL-0468	1987
Autonomous Land Vehicle (ALV) Program, Sixth Quarterly Report, The	ETL-0483	1987

TITLE	REPORT NO.	YEAR
Autonomous Land Vehicle (ALV) Program, Seventh Quarterly Report, The	ETL-0496	1988
Autonomous Land Vehicle (ALV) Program Phase I, Final Report	ETL-0506	1988
Autonomous Land Vehicle (ALV) Planning and Navigation, Second Annual Report	ETL-0511	1988
Autonomous Land Vehicle (ALV) Planning and Navigation System, Final Annual Report	ETL-0539	1989
Background Study and Selection Criteria Analysis of MIL-STD-810C: Environmental Test Methods	ETL-0154	1978
Backscattering of Electromagnetic Waves from a Slightly Rough Surface with a Lossy Layer	ETL-TR-74-10	1974
Backscattering of Electromagnetic Waves from a Surface Composed of Two Types of Surface Roughness	ETL-TR-71-4	1971
Backscattering of Radar Waves by Vegetated Terrain	ETL-0105	1977
Backscattering of Radar Waves from a Tilted, Slightly Rough Surface	ETL-0124	1977
Base Plant Correlator	ETL-CR-71-15	1971
Base Plant Correlator (Final)	ETL-CR-73-3	1973
Basic Factors Limiting the Accuracy of Mapping and Aerotriangulation by Photogrammetric Procedures	AD 77 390	1955
Battlefield Assessment and Decision Assistance System Using Neural Networks and an Expert System Director	TEC-0002	1992
Bayesian Approach to Identification of a Remotely Sensed Environment	AD 860 060	1969
Bibliographic Literature Search Concerning the Relationship Between Soils and Plants in Arid and Semi Arid Regions in North America	ETL-0171	1978
Bibliography and Abstracts of Analytical Photogrammetry	1487-TR	1957
Bibliography of In-House and Contract Reports	ETL-SR-70-1	1970
Bibliography of In-House and Contract Reports, Supplement 1	ETL-SR-71-3	1971
Bibliography of In-House and Contract Reports, Supplement 2	ETL-SR-72-3	1972
Bibliography of In-House and Contract Reports, Supplement 3	ETL-0013	1975
Bibliography of In-House and Contract Reports, Supplement 4	ETL-0042	1976

TITLE	REPORT NO.	YEAR
Bibliography of In-House and Contract Reports, Supplement 5	ETL-0104	1977
Bibliography of In-House and Contract Reports, Supplement 6	ETL-0143	1978
Bibliography of In-House and Contract Reports, Supplement 7	ETL-0180	1979
Bibliography of In-House and Contract Reports, Supplement 8	ETL-0216	1980
Bibliography of In-House and Contract Reports, Supplement 9	ETL-0255	1981
Bibliography of In-House and Contract Reports, Supplement 10	ETL-0282	1982
Bibliography of In-House and Contract Reports, Supplement 11	ETL-0320	1983
Bibliography of In-House and Contract Reports, Supplement 12	ETL-0353	1984
Bibliography of In-House and Contract Reports, Supplement 13	ETL-0395	1985
Bibliography of In-House and Contract Reports, Supplement 14	ETL-0434	1986
Bibliography of In-House and Contract Reports, Supplement 15	ETL-0500	1988
Bibliography of In-House and Contract Reports, Supplement 16	ETL-0550	1989
Bibliography of In-House and Contract Reports, Supplement 17	ETL-0575	1991
Bibliography of In-House and Contract Reports, Supplement 18	TEC-0023	1992
Bibliography of In-House and Contract Reports, Supplement 19	TEC-0058	1994
Bibliography of In-House and Contract Reports, Supplement 20	TEC-0087	1996
Bibliography on the Chemical Weathering of Granitic Rocks, A	ETL-0505	1988
Bimodal Display	ETL-0110	197
Blue Laser	ETL-0412	1985
Brigade-Level Hard Copy Device	TEC-0019	1991
Broad-Spectrum Electromagnetic Spectrum Backscatter	AD 878 341L	1970
Brush Surfaced Lithographic Press Plates	1452-TR	1956
Building a 3-D World Model for a Mobile Robot from Sensory Data	ETL-0490	1988
Built-Up Area Feature Extraction: First Year Report	ETL-0561	1990
Built-Up Area Feature Extraction: Second Year Technical Progress Report	ETL-0562	1990

TITLE	REPORT NO.	YEAR
Built-Up Area Feature Extraction: Final Report	TEC-0016	1991
Camera Calibration Study		no date
Capabilities of Remote Sensors to Determine Environmental Information for Combat	ETL-0081	1976
Cartographic Application of Conflex I	AD 882 789L	1964
Cartographic Design Standards — A Preliminary Investigation		1967
Cartographic Drafting Methods and Equipment	1305-TR	1953
Cartographic Drafting Methods and Equipment (Plastic Scribing Process) Second Interim Report	1339-TR	1954
Cartographic Electron Beam Recorder (EBR) System	ETL-0111	1977
Cartographic Electron Beam Scanner Design Study	ETL-0257	1981
Cartographic Scanner Plotter	ETL-CR-72-12	1972
Change Detector Maintenance Instructions		1966
Change Detector Operation Manual		1965
Change Detector Studies		1961
Characterization and Optimization of an Electro-Optic Imaging Device for Real-Time Map Profiling	ETL-CR-74-18	1974
Characterization of the PROM for Coherent Optical Processing Applications	ETL-0053	1976
Charging Equipment, Mobile (CEM)	ETL-0089	1976
Chemical Array Studies	ETL-0130	1977
Circularly Polarized Measurements of Radar Backscatter from Terrain	ETL-0199	1980
Circularly Polarized Measurements of Radar Backscatter from Terrain and Snow Covered Terrain	ETL-0234	1980
Circumpolar Method for Determining Azimuth	ETL-0317	1983
Classification and World Distribution of Vegetation Relative to V/STOL Aircraft Operations	ETL-SR-74-4	1973
Classification of Cartographic Features Through Walsh Transforms	ETL-0290	1982
Classification of Metamorphic Rocks and Their Applications to Air Photo Interpretation Procedures, The	ETL-0341	1983
Classification of Selected Radar Imagery Patterns Using a Binary Tree Classifier	ETL-0442	1986
Climatic Information for Application in Designing and Testing U.S. Army Materiel	ETL-0474	1987
CMU (Carnegie-Mellon University) Strategic Computing Vision Project Report: 1984 to 1985	ETL-0466	1987

TITLE	REPORT NO.	YEAR
Coated Paper and Developer for Continuous Tone Electrophotography	AD 674 241	1968
Cold Weather Testing of 10-Second Direction Theodolite, 1-Minute Direction Theodolite (Foreign Model), Astronomical Attachment, and Winterization Kit	1288-TR	1953
Color Contact Printer Mark III	ETL-ETR-70-9	1970
Color Ink-Jet Demonstration Program	ETL-0196	1979
Color Orthophotomaps	ETL-ETR-72-2	1972
Color Separation System Evaluation	AD 672 078	1968
Combination Map Reproduction Van Body	1536-TR	1958
Combined Engineering and Service Tests of the Copy and Supply Van Section of the Motorized Photomapping Train	1444-TR	1956
Combined Engineering and Service Tests of the Map Revision Van Section of the Motorized Photomapping Train	1447-TR	1956
Combined Engineering and Service Tests of the Multiplex Van Section of the Motorized Photomapping Train	1520-TR	1958
Combined Engineering and Service Tests of the Photomapping Van Section of the Motorized Photomapping Train	1428-TR	1955
Combined Engineering and Service Tests of the Rectifier Van Section of the Motorized Photomapping Train	1544-TR	1958
Comparative Aerotriangulation Tests of the Multiplex Kelsh Plotter, Stereoplanigraph, Wild Autograph Model A-5, and Wild Stereoplotter Model A-6	1349-TR	1954
Comparative Study of Photography for Soils and Terrain Data	38-TR	1968
Comparison of Air Photo Landform Units to Statistically Defined Groups of Tors in Dartmoor, Southwest England	TEC-0001	1992
Comparison of Air Photo Lineations and Joint Patterns, Dartmoor, Southwest England	TEC-0006	1992
Comparison of Soils from Twentynine Palms, CA and Saudi Arabia, A	ETL-0583	1991
Comprehensive Summary of Project Trend	ETL-0041	1975
Computer-Assisted Likely Minesite Prediction Model and Estimated Electromagnetic and Thermal Soil Properties	ETL-0391	1985
Computer Automated Image Classification	TEC-0074	1995

TITLE	REPORT NO.	YEAR
Computer for Army Artillery Inertial Survey System (GEISHA)	AD 814 052	1963
Computer Generation of Fractal Terrains	ETL-0504	1988
Computer Program to Simulate Scenario Functions	ETL-0025	1975
Computer Strategy for Detecting Line Features on Simulated Binary Arrays in Support of Radar Feature Extraction	ETL-0478	1988
Computing a Line-of-Sight Using Digital Image Matching and Analytical Photogrammetry	ETL-0027	1975
Consensus Theory in Expert Systems: An Adaptive Inference Framework and Application to Image Understanding	ETL-0524	1988
Concept Development of Automated Image Analysis	ETL-0194	1979
Concept Development of Automatic Instrumentation for Monitoring Movement of Dams	ETL-0187	1979
Concept for an Ultraprecise Geodetic Baseline	RN-24	1967
Conifer Tree Influence on Digital Terrain Elevation Data (DTED): A Case Study at Dulles International Airport	TEC-0038	1993
CONPLOT I — A Contour Generating Program	ETL-CR-70-2	1970
CONPLOT II — A Contour Generating Program	ETL-CR-71-1	1971
CONRAD — A Program to Contour Radar Data	ETL-CR-73-20	1973
Continuous-Tone Electrophotography	AD 673 881	1968
Contour Digitizing and Tagging Software (CONTAGRID)	ETL-0228	1980
Contour-to-Grid Interpolation with Nonlinear Finite Elements: A Feasibility Study	ETL-0472	1987
Contribution to the Philosophy of Climatic Design Limits for Army Materiel: Extreme Hot-Desert Conditions	ETL-TR-72-5	1972
Control Unit for Army Artillery Inertial Survey System (GEISHA)	AD 814 068	1968
Controlled Color for Contact Printing Aerial Imagery	ETL-TR-72-4	1972
Conversion of the CALAP Program from FORTRAN to DUCK. Final Report	ETL-0419	1986
Cooperative Autonomous Agents Testbed - First Annual Report	ETL-0571	1990
Cooperative Autonomous Agents Testbed - Second Annual Report	TEC-0051	1993
Coordinate Measurement Research: Basic and Applied Experiments with the Negative-Reticle Concept	ETL-CR-72-14	1972
Corona Study Relevant to Electrostatic Printing Process	ETL-CR-71-22	1971

TITLE	REPORT NO.	YEAR
Corps of Engineers Maintenance Package for Inertial Survey Equipment	AD 847 498	1963
Correlation of Noisy Images	ETL-0230	1980
Cultural Data Base Implementation Study and Computer-Aided Scene Modeling System Users Manual	ETL-0380	1984
Cumulative Probability Tables for Testing Consensus in Ranking Experiments	ETL-0418	1986
Data Base Sizing Methodology Applied to the Army Terrain Information System (ARTINS)	ETL-0150	1978
Data Integrity Factors Affecting the Construction of the Mapping, Charting, and Geodesy Data Base	ETL-0357	1983
Data Weighing Analysis	AD 672 101	1968
Decision Aid for Integrated Air Defense Planning	TEC-0060	1994
Decision Path Approach to Guidance for Climatic Environmental Test Planning (MIL-STD-810C)	ETL-0183	1979
Defense Mapping Agency Advanced Raster-to-Vector Benchmark Testing	ETL-0420	1986
Defense Mapping Agency (DMA) Raster-to-Vector Analysis	ETL-0383	1984
Defense Mapping Agency (DMA) Raster-to-Vector Analysis — Appendix	ETL-0383A	1984
Defense Mapping Agency (DMA) Raster-to-Vector Benchmark Testing	ETL-0384	1984
Delta Pulse Code Modulation Compression Relative to Stereo Image Matching	ETL-0157	1978
Demonstration and Evaluation of the Utilization of Side-Looking Airborne Radar for Military Terrain Analysis	ETL-0023	1975
Derivation and Potential of New Filter Equations for Numerical Weather Prediction	ETL-RN-71-3	1971
Description of Instrumentation Data Analysis and Reduction for an Atmospheric Seeing Monitor	AD 701 124	1969
Design and Analysis of a High-Production Mini-Computer System for Regridding Digital Terrain Elevation Matrices	ETL-0240	1980
Design and Development of a Position and Azimuth Determining System (PADS)	ETL-CR-71-18	1971
Design and Development of an Advanced Electron Beam Control System	ETL-0032	1975
Design and Development of Power Package for Surveying Instrument: Azimuth, Gyro, Lightweight	ETL-CR-71-5A	1971

TITLE	REPORT NO.	YEAR
Design and Development of Surveying Instrument: Azimuth, Gyro, Lightweight (SIAGL)	ETL-CR-71-5	1971
Design and Fabrication of a 70 Millimeter Interference Imaging System	ETL-CR-71-8	1971
Design and Fabrication of an Experimental Multiband Camera	ETL-CR-71-28	1971
Design and Feasibility Study of an Off-Line Digital Orthoprinter for Field Use	ETL-0149	1978
Design and Feasibility Study of HOC as a Van Mounted Stereo Model Digitizer	ETL-0109	1977
Design, Fabrication, and Test of a Position and Azimuth Determining System (PADS)	ETL-CR-73-6	1973
Design Issues in Video Disc Map Display	ETL-0362	1984
Design, Modification, Fabrication, and Test of a Prototype Miniaturized North Reference Unit (MINRU)	ETL-0276	1979
Design of a Laser Experiment for the Verification of the Inverse Scattering Theory	AD 463 012L	1965
Design of a Map Update Capability for Engineer Topographic Units	ETL-0107	1977
Design of an Experimental Program for Evaluation of LBR Systems	ETL-0182	1979
Design of Engineering Test Model, Topographic Data System		
Volume 1	AD 270 216L	1961
Volume 2	AD 270 205L	1961
Volume 3	AD 270 207L	1961
Volume 4	AD 270 210L	1961
Volume 5	AD 270 209L	1961
Design Studies and Prototype Model Development of a Small North Orienting Device (Miniaturized Gyrocompass)	ETL-CR-70-4	1970
Design Study of a Large Format Printer (LFP)	ETL-0368	1984
Desk Model Fotosetter Photo-Lettering Machine 1953	1329-TR	
Detecting Line-Road and Road-Intersection Patterns at Various Angles	ETL-0274	1981
Determination of Height Differences from Gravity and Gravity Gradients	ETL-71-CR-10	1971
Determination of Level Sensitivity (Field Calibration with the Level on the Instrument)	ETL-RN-74-4	1974
Determination of the Anomalous Gravity Potential from Satellite and Terrestrial Data Under Utilization of Modern Gravimetric Theory	ETL-RN-73-2	1973

TITLE	REPORT NO.	YEAR
Determination of the Geometrical Quality of Comparators for Image Coordinate Measurements	RN-3	1962
Determinations and Statistical Studies of Gravimetric Deflections	ETL-CR-74-8	1973
Determinations and Statistical Studies of Gravimetric Deflections, Final Report	ETL-0017	1975
Determinations of Direct and Inverse Azimuths, Zenith Distance, Hour Angle, Declination and Distance Between Two Points on Normal Sections	RN-19	1967
Determining an Azimuth with a Gyrotheodolite	ETL-0440	1986
Determining the Translation of a Rigidly Moving Surface, Without Correspondence	ETL-0475	1986
Developing a Data Base for Predicting Soviet Tactical Behavior	ETL-0015	1975
Development of a High Precision Capability for Monitoring Structural Movements of Locks and Dams	ETL-0121	1977
Development of an Integrated Mobile Robot System at Carnegie Mellon University	ETL-0546	1989
Development of an Integrated Mobile Robot System at Carnegie Mellon University	ETL-0565	1990
Development of a Prototype Family of Military Geographic Intelligence Products to Support Airmobile Operations	ETL-ETR-70-7	1970
Development of a Small North Orienting Device	AD 869 896L	1970
Development of a Statistical Method for Three Dimensional Terrain Elevation Error Analysis	TEC-0030	1991
Development of a Terrain Profile Recorder Image Point Transfer Instrument	AD 649 830	1967
Development of Automatic Names Placement Software	ETL-0484	1987
Development of a Variscale Stereo Point Marking Instrument	AD 643 722	1966
Development of an Evaluation Model-Change Detector		1965
Development of an Experimental Family of Military Geographic Intelligence (MGI) Products to Support Battlefield Sensor Activities	ETL-TR-72-3	1972
Development of an Integrated Mobile Robot System at Carnegie Mellon University	ETL-0565	1990
Development of an Integrated Mobile Robot System at Carnegie Mellon University	ETL-0546	1989
Development of an Integrated Mobile Robot System at CMU, June 1987 Annual Report	ETL-0508	1988

TITLE	REPORT NO.	YEAR
Development of a Statistical Method for Three-Dimensional Terrain Elevation Error Analysis, Phase II	TEC-0066	1995
Development of Computer Vision Techniques for Automatic Feature Extraction	ETL-0451	1987
Development of Descriptor Sets for the Unambiguous Characterization of Geographic Features on SAR Imagery	ETL-0369	1984
Development of Electronic Control of a Superconducting Gravity Gradiometer	ETL-0397	1985
Development of Electronic Control of a Super-conducting Gravity Gradiometer — Phase II	ETL-0447	1986
Development of Finite Element Models for the Earth's Gravity Field Phase I: Macro Gravity Model for Satellite Orbit Integration	ETL-0096	1977
Development of Finite Element Models for the Earth's Gravity Field Phase II: Fine Structure Disturbance Gravity Representations	ETL-0097	1977
Development of Height Finder Oblique, Topographic	1383-TR	1954
Development of High Speed CRT Print Head Systems for Cartographic Applications	ETL-0213	1980
Development of Improved Area Correlation Techniques	ETL-CR-73-19	1973
Development of Lightweight Long-Range Survey System (LRSS)	AD 477 042	1965
Development of Spherical Map Sections and Transparent Conforming Overlays	1440-TR	1956
Development, Service Tests, and Production Model Tests, Autofocusing Rectifier	1307-TR	1953
Development, Test, Preparation, Delivery, and Installation of Algorithms for Optimal Adjustment of Inertial Survey Data	ETL-1307	1982
Developmental Optical Correlator	ETL-0033	1975
DFAD PLUS System Development	TEC-0031	1992
Digest of High Temperature Storage Literature	ETL-0152	1978
Digital Automatic Map Compilation System	AD 285 258	1962
Digital Cartographic Study and Benchmark	ETL-0168	1978
Digital Cartographic Study and Benchmark — First Interim Technical Report	ETL-0090	1975
Digital Cartographic Study and Benchmark — Second Interim Technical Report	ETL-0091	1975
Digital Cartographic Study and Benchmark — Third Interim Technical Report	ETL-0092	1976
Digital Cartographic Study and Benchmark — Fourth Interim Technical Report	ETL-0093	1977

TITLE	REPORT NO.	YEAR
Digital Computer Program for the Solution of a Photogrammetric Net (Preparation of Maps from Aerial Photographs)	AD 711 858	1961
Digital Data Editing System	ETL-0146	1977
Digital Data to Pressplate Study	ETL-0044	1976
Digital Image Manipulation and Enhancement System (DIMES) User's Handbook	ETL-CR-73-7	1973
Digital Laser Platemaker Modifications	ETL-0379	1984
Digital Map Color Proofing Methodologies Evaluation, Final Report	ETL-0372	1984
Digital Map Color Proofing Methodologies Evaluation, Final Report (Proprietary)	ETL-0373	1984
Digital Mapping Glossary	AD A782 328	1974
Digital Mapping System Concepts Study	ETL-CR-71-26	1971
Digital Mapping System: Mathematical Processing	ETL-CR-74-6	1974
Digital Mapping System Study	ETL-CR-71-25	1971
Digital Multicolor Recorders and Scanner The Technology and the Equipment	ETL-0551	1989
Digital Planimetric Compiler	ETL-ETR-72-1	1972
Digital Pre-Press System Design Study	ETL-0339	1983
Digital Radar Restitution	AD 448 230L	1964
Digital Rectification of Side-Looking Radar (DRESLR)	ETL-CR-73-18	1973
Digital Simulation of a Radar Image of Pisgah Crater Test Site, California	ETL-0019	1975
Digital Terrain Analysis Module (DTAM)	TEC-0018	1991
Digital Terrain Data Compaction Using Array Algebra	ETL-0108	1976
Digital Terrain Elevation Data (DTED) Resolution and Requirements Study: Phase 2 Report	TEC-0035	1993
Digital Terrain Elevation Data Resolution and Requirements Study - Interim Report	ETL-SR-6	1990
Digital Terrain Elevation Model Analysis	ETL-0393	1985
Dimensionally Stable Opaque Cartographic Bases	1469-TR	1956
Direct Digital Color Proofing Technology Overview	ETL-0351	1984
Direct Electronic Transforms for Feature Extraction	ETL-0139	1978
Discrete Scattering Approach to Vegetation Modeling	ETL-0215	1980
Discrimination of Tropical Land Use in Puerto Rico: An Analysis Using Multispectral Imagery	ETL-CR-71-20	1971
Discrimination of Water from Shadow Regions on Radar Imagery Using Computer Vision Techniques	ETL-0404	1985
Display Technologies for Topographic Applications. Assessment of State-of-the-Art and Forecast	ETL-0016	1975

TITLE	REPORT NO.	YEAR
DIS Terrain Data Format Study	TEC-0076	1995
Distribution of Mean Monthly Precipitation and Rainfall Intensities	ETL-SR-72-5	1972
Diurnal Freeze-Thaw Frequencies in Selected Regions of the High Latitudes	ETL-0364	1984
Domain-Dependent Reasoning for Visual Navigation of Roadways	ETL-0445	1986
Doppler Satellite for Army Field Operations	AD 470 472	1965
Doppler Translocation Test Program	41-TR	1968
Doppler Translocation Test Program	ETL-ETR-74-5	1974
Dynamic Image Interpretation for Autonomous Vehicle Navigation	ETL-0437	1986
Dynamic Image Interpretation for Autonomous Vehicle Navigation, 1987 End of Year Technical Report	ETL-0516	1988
Dynamic Image Interpretation for Autonomous Vehicle Navigation - Final Report	ETL-0549	1989
Earth's Gravitational Field from Observations of Near-Earth Satellites and Terrestrial Gravity Measurements	RN-30	1968
EBR Extension of Graphics Generator to Include Symbols	ETL-CR-74-12	1974
Edge Detection Experiment Using the MARR Operator, An	ETL-0435	1986
Effects of Soil Moisture and Vegetation on Surface Temperature, The	ETL-0324	1983
Effects of Supersonic and Hypersonic Aircraft Speed upon Aerial Photography	AD 226 577	1959
Effects of Supersonic and Hypersonic Aircraft Speed upon Aerial Photography	AD 248 726	1960
Effects of Supersonic and Hypersonic Aircraft Speed upon Aerial Photography, Final Report		1960
Effects of the Atmosphere on Aerial Photography	TN-70-1	1970
Electrofax Specifications for Army Five-Color Map Reproducing Equipment	AD 841 828L	1968
Electron Beam Recorder Applications Study	ETL-0120	1970
Electronic Angle-Measuring Device	ETL-TR-72-1	1972
Electronic Feedback Control of Mass-Spring Systems	ETL-0398	1985
Electronic Pointing Device (Microwave) System (Electrotransit)	AD 471 726L	1965
Electronic Printing Systems	ETL-0423	1986
Electronic Survey Equipment and Tests	AD-264 454	1960
Electro-Optical Image Processing with an Image Storage Tube	AD A836 685	1968
Electrophotographic Imaging Materials Evaluation	ETL-0266	1981
Electrostatic Paper and Toner Development		1969

TITLE	REPORT NO.	YEAR
Elevation Data Compaction by Polynomial Modeling	ETL-0140	1978
Elevation Data Edit Terminal	ETL-0328	1983
El Nino—Its Far Reaching Environmental Effects on Army Tactical Decision Aids	TEC-0080	1996
Empirical Surface Temperature Model, An	ETL-0503	1988
Emergency Target Location Function	21-TR	1965
End of Year Report for Parallel Vision Algorithm Design and Implementation	ETL-0467	1987
End of Year Technical Report: Dynamic Image Interpretation for Autonomous Vehicle Navigation	ETL-0463	1987
Engineer Design Test and Evaluation of a Planimetric Compiler	35-TR	1966
Engineer Design Tests and Evaluation of a Multipower Army Stereoscope	12-TR	1963
Engineer Route Reconnaissance Feasibility Study	AD 486 337L	1966
Engineer Test and Evaluation of the Command-Retrieval Information System/Direct Input (CRIS/DI)	42-TR	1968
Engineer Tests of 2.5 x Reduction Printer	ETL-ETR-74-7	1975
Engineering Design Test Report: Inertial Surveying Equipment (ISE)	16-TR	1963
Engineering Evaluation of Pulsed Xenon Light Sources for Graphic Arts Use, An	2-TR	1961
Engineering Test Report: Elevation Meter, Ground	5-TR	1962
Engineering Test Report: Lightweight Gyro Azimuth Theodolite (Lear North-Seeking Gyro Model No. 11NG530A)	11-TR	1963
Engineering Test Report of the Integrated Mapping System	7-TR	1962
Engineering Test Report Short Range Electronic Positioning Equipment (SREPE)	9-TR	1963
Engineering Tests and Evaluation of a 9 by 18 in Electronic Printer	1646-TR	1960
Engineering Tests and Evaluation of Multiplex Reduction Printer for Metrogon and Distortion-Free Photography	1431-TR	1955
Engineering Tests and Evaluation of Printers for the Preparation of 9½- by 9½-inch Diapositives for the Precision Stereoplotter	1538-TR	1958
Engineering Tests and Evaluation of the Photogrammetric Transforming Printer for 20° Convergent Photograph	1497-TR	1957
Engineering Tests of a Temperature-controlled Processing Unit, Deep-tank, for Photomechanical Film	1599-TR	1959

TITLE	REPORT NO.	YEAR
Engineering Tests of Diapositive Processing Unit	1628-TR	1960
Engineering Tests of Interim Target Location Systems for Use in Controlled Areas	1498-TR	1957
Engineering Tests of Interim Target Location Systems for Use in Uncontrolled Areas	1612-TR	1960
Engineering Tests of Opaque Cartographic Bases	1290-TR	1953
Engineering Tests of Scanning Stereoscope	1491-TR	1957
Engineering Tests of the Cartographic Grid Ruler	1486-TR	1957
Engineering Tests of the Cartographic Van Section of the Motorized Photomapping Train	1373-TR	1954
Engineering Tests of the PPI Radar Presentation Restitutor	1629-TR	1960
Engineering Tests of Translucent Cartographic Bases	1461-TR	1956
Engineering Tests of Two Printer-Developers, Ammonia Process, 24 Inch	1292-TR	1953
Enhanced Photomap Evaluation Study	AD 651 396	1967
Enlarging Printer, 3x	ETL-0049	1976
Environmental Conditions Experienced by Rockets and Missiles in Storage, Transit, and Operations	ETL-CR-74-3	1973
Environmental Conditions Experienced by Rockets and Missiles in Storage, Transit, and Operations, Supplement	ETL-CR-74-3-S	1973
Environmental Conditions in a Tropical Forest Region in Thailand	ETL-0129	1974
Environmental Position Errors of the GPS — Army User Equipment	ETL-0055	1976
Equilibrium Figures and the Normal-spheroid of the Earth Mass-Functions and Isostasy		1968
Equipment and Techniques for the Utilization of Convergent Photography in Mapping	1583-TR	1959
Error-Free Compression of Digital Imagery	ETL-0079	1976
Error Propagation into Orbital Positions	ETL-CR-73-13	1973
Error Propagation in Two-Photo Intersection	ETL-RN-72-1	1972
Error Statistics for Astrogeodetic Positions for an RGSS Test Course	ETL-0267	1981
Errors in Automatic Pass Point Mensuration Using Digital Techniques	ETL-0232	1980
Establishment of an Ideal World Geodetic System	AD 680 225	1968
ETAK Navigator Modification Final Report	ETL-0569	1990
ETL 211-OD Gravitational Model, A Union Solution of Optical and Doppler Satellite Determinations	AD 502 044L	1968

TITLE	REPORT NO.	YEAR
Evaluating Soil Moisture and Textural Relationships Using Regression Analysis	ETL-0226	1980
Evaluation and Comparison of Terrain Classification Methods (Type III)	AD 845 338L	1968
Evaluation and Test of a Five-Color Electrostatic Printing Machine for the Reproduction of Topographic Maps and Charts	25-TR	1965
Evaluation and Test of a Modified Plate Process Section, a Proposed New Photomechanical Process Section and a Redesigned Brush-Surfacing Machine	1560-TR	1959
Evaluation and Test of a Self-Contained Vehicle Land Navigation System	ETL-0167	1979
Evaluation and Test of a Single-Color Electrostatic Printing Machine for the Reproduction of Topographic Maps and Charts	19-TR	1964
Evaluation of a New Electrostatic Recording Medium	ETL-0102	1977
Evaluation of a Xerographic Process for Preparing Zinc Oxide-Silicone, Binder-Type Lithographic Plates	1545-TR	1958
Evaluation of Automatic Mapping APQ as a Radar Mapping System	31-TR	1966
Evaluation of Coherent Radar Photography	18-TR	1963
Evaluation of Color Recognition Devices for Making Color-Separations from Multicolor Maps and Charts	1401-TR	1955
Evaluation of Color Test Photography for Military Geographic Analysis: A Literature Review	ETL-TR-70-6	1970
Evaluation of Components for Some Elevation-Determining Systems	AD 407 297L	1963
Evaluation of Conventional Correlation Methods When Matching Infrared Imagery to Panchromatic Imagery	ETL-0195	1979
Evaluation of Experimental Xerographic Process for Lithographic Platemaking	1417-TR	1955
Evaluation of High Precision SHORAN-Controlled Photography	1484-TR	1957
Evaluation of Land Use Techniques for Processing MGI	AD 817 124L	1967
Evaluation of Multiband and Color Aerial Photography for Selected Military Geographic Intelligence in a Subtropical Desert Environment	54-TR	1970

TITLE	REPORT NO.	YEAR
Evaluation of Offset Collotype Printing for the Field Reproduction of Aerial Photographs	1465-TR	1956
Evaluation of Pointing to a Sharp Edge	AD 668 260	1968
Evaluation of Published Criteria for Identifying Metamorphic Rocks on Air Photos: Two Case Studies in the Northeastern United States	ETL-0326	1983
Evaluation of Registering Image Gradients When Matching Infrared Imagery to Panchromatic Imagery	ETL-0250	1981
Evaluation of Single and Multicolor Map and Chart Reproduction Equipment	ETL-0080	1976
	ETL-0553	1989
Evaluation of the Bathyscan Sweep Survey System	TEC-0008	1992
Evaluation of the ERDAS Image Processing System and Its Potential Role in the Digital Topographic Support System, An		
Evaluation of the Hydrographic Inland Marine Acoustic Platform (HI-MAP) Survey System, An	TEC-0012	1992
Evaluation of the Method of Determining Parallax from Measured Phase Difference	ETL-0145	1977
Evaluation of the Prototype, Natural-Image Computer	48-TR	1969
Evaluation of the Stellar-Moon Camera System	AD 673 270	1968
Evaluation Tests of Royal Zenith, 29-Press	1490-TR	1957
Evidential Reasoning in Expert Systems for Image Analysis	ETL-0381	1985
Existing Resources, Standards, and Procedures for Precise Monitoring and Analysis of Structural Deformations - Volume I	TEC-0025	1992
Experimental Assessment of Improved Spatial Resolution LANDSAT Data	ETL-0268	1981
Experimental Correlator Studies	AD 374 450L	1966
Experimental Determinations of Fringe Counting Errors Associated with Rotation of a Corner Cube Forming an Arm of a Laser Interferometer	RN-26	1967
Experimental Heterodyne Optical Correlator	ETL-0071	1976
Experimental Production of Military Geographic Intelligence Products from Side-Looking Airborne Radar Imagery	AD 376 554	1966
Expert System for Minefield Site Prediction, Phase I, First Year Report	ETL-0492	1988
Expert System for Minefield Site Prediction, Phase II, Final Report	ETL-0534	1989
Expert System for Minefield Site Prediction, Phase III, Final Report	ETL-0552	1989
Expert System for the Computer-Assisted Identification of Features on SAR Imagery, An	ETL-0415	1986

TITLE	REPORT NO.	YEAR
Expert Vision System for Autonomous Land Vehicle Road Following, An	ETL-0489	1988
Extended Area Exit Pupil Viewer	ETL-0399	1985
Extension of Kendall's Concordance Test Where Ties are Allowed, An	ETL-0316	1983
Extraction of Mapping Detail from Radar Photography	AD 328 256	1961
Extraction of Mapping Detail from Radar Photography	AD 328 257	1961
Extreme 24-Hour Snowfalls in the United States: Accumulation, Distribution, and Frequency	ETL-SR-73-4	1973
Feasibility of a Reduced Power-Consumption Magnetometer for Use in a Digicomp Lensatic Com s	ETL-0547	1989
Feasibili of Using Optical Power Spectrum Analysis Techniques for Automatic Feature Classification from High Resolution Thermal, Radar, and Panchromatic Imagery	ETL-0186	1979
Feasibility Study for an All-Weather Surveying Signal Light	37-TR	1968
Feasibility Study for Field Generation of Input for Radar Scene Generation from DLMS Terrain and Elevation Data	ETL-0203	1978
Feasibility Study of a Quick Response Multicolor Printer (QRMP)	ETL-0242	1980
Feasibility Test of a Proposed 3-D Radar System	AD 349 882L	1964
Feasibility Test Program for Measurement of Gravity Anomaly Changes Using 2 MICRO-g Accelerometer in the Inertial Platform	ETL-CR-74-16	1974
Feature Analysis and Reduction of Laws Texture Measure	ETL-0343	1983
Feature Component Reduction Through Divergence Analysis	ETL-0305	1982
Feature Extraction Assessment Study, Final Report	ETL-0377	1984
Feature Extraction of the Illiac IV	ETL-0191	1979
Feature Tagging	ETL-0227	1980
FEED Evaluation	ETL-0322	1983
FEED Software Documentation	ETL-0335	1983
Fictitious Data Generator for Analytical Aerotriangulation	AD 640 799	1965
Field Artillery Plotting Equipment	1421-TR	1955
Final Report, Development of Mirror Stereoscope	1382-TR	1954
Final Report on Stable Cartographic Bases	1542-TR	1958
Final Report, Study of Digital Matching of Dissimilar Images	ETL-0244	1980

TITLE	REPORT NO.	YEAR
Finite Element Models of the Earth's Gravity Field Phase IV	ETL-0198	1979
Five-Color Separation Investigation	AD 662 725	1967
Fixed and Multiple Frequency Angle Measurements with 35-GHz Microwaves	33-TR	1966
Floodplain Tree Species: A Bibliographic Literature Search with Abstracts	ETL-0193	1979
Flux Valve Heading Reference System	ETL-0134	1977
Forced Dynamics of Asymmetric Spacecraft	ETL-0039	1976
Forecast for the 1970's in Mapping, Charting, and Geodesy Research and Development	TN-70-2	1970
Formulas for Computing Atmospheric Refraction for Objects Inside or Outside the Atmosphere	RN-8	1963
Formulation of a Space Oblique Mercator Map Projection	ETL-0131	1977
Fort Belvoir Text Placement System, Final Technical Report	ETL-0199	1979
Fourier Transform Autocorrelation	ETL-0184	1979
Fractures in Rock: An Annotated Bibliography	ETL-0555	1990
Frequency Dependence of Backscatter from Rough Surfaces (An Experiment with Broad-Spectrum Acoustic Waves)	AD 847 275	1968
Full Color Recorder	TEC-0049	1994
Full View Holograms	ETL-CR-70-1	1970
Further Investigation of an Electronic Angle-Measuring Device	ETL-TR-74-1	1973
Further Study of Digital Matching of Dissimilar Images	ETL-0385	1985
Gamma-Ray Spectrometer Study	ETL-0008	1975
GEISHA Computer Theory of Operation	AD 883 289L	no date
General Climatological Guide to Daily Freezing Conditions: Frost Days, Ice Days, and Freeze-Thaw Days, A	ETL-0287	1982
General Non-iterative Solution of the Inverse and Direct Geodetic Problems	RN-11	1963
General Programming on a Parallel Processor	ETL-0062	1976
Geocentric Position and/or Orbital Parameters with Star Satellite Photography from a Single Camera Station	CR-102-1	1963
Geodetic Control by Means of Astronomic and Torsion Balance Observations and the Gravimetric Reduction of Levelling	AD 672 491	1967
Geodetic Control without Triangulation, Trilateration, or Gravity Data and Gravimetric Reduction of Levelling		

TITLE	REPORT NO.	YEAR
1st Interim Report	AD 447 994L	1964
2nd Interim Report	AD 461 100L	1965
3rd Interim Report	AD 477 474L	1965
Geodetic SECOR	AD 721 648	1962
Geodetic SECOR Ground Equipment	AD 721 649	1964
Geodetic SECOR Satellite	ETL-TR-74-6	1974
Geodetic SECOR Wide-BandRF Subsystem	AD 721 641	1967
Geodetic SECOR Wide-Band RF Subsystem for SECOR Ground Equipment Sets	AD 824 780L	1967
Geodetic SECOR Wide-Band System	AD 721 640	1966
Geodetic Spacecraft, Final Report	AD 721 650	1961
Geodetic Spacecraft, Addendum	AD 721 651	1961
Geodimeter, Models I and II	1495-TR	1957
Geographic Modelling of Insurgency Resources	AD 848 723L	1969
Geographic Modelling of Insurgency Resources, Appendix	AD 851 896L	1969
Geoid Representation from Satellite-Determined Coefficients	AD 634 541	1966
Geologic Evaluation of Radar Imagery from Darien Province, Panama	AD 853 884	1969
Geometric Simultaneous Multistation Determination, with Constraints, Using Data from Geodetic Satellites, A	RN-22	1967
Geometrical Quality of Lunar Mapping by Photogrammetric Methods	RN-9	1962
Geomorphic Evaluation of Radar Imagery of Southeastern Panama and Northwestern Columbia	ETL-CR-71-2	1971
Geopotential Determination from Satellite to Satellite Tracking and Satellite Altimetry	ETL-CR-74-21	1975
Geopotential Determination from Satellite to Satellite Tracking and Satellite Altimetry, Supplement I	ETL-CR-74-21-S	1975
GEOPS	RN-25	1967
Geoscience Potentials of Side-Looking Radar, Vol. I	AD 650 498	1965
Geoscience Potentials of Side-Looking Radar, Vol. II	AD 650 499	1965
Geo-Spin Precision Inertial Survey	ETL-0135	1978
Gigas-Zeiss Digital Control Unit	ETL-ETR-73-1	1973
Global Climate Change (GCC) Issues and Their Impacts on the U.S. Army Corps of Engineers	TEC-SR-1	1991
GPS Tides: A Project to Determine Tidal Datums with the Global Positioning System	TEC-0071	1995
Gradiometer-Aided Rapid Gravity Survey System	ETL-0112	1977
Graphic Arts Symbol Generating Hardware for a Gerber Plotting System	ETL-CR-74-14	1974

TITLE	REPORT NO.	YEAR
Graphic Data Handling Techniques	AD 659 807	1967
Gravimetric Geodesy Free of Density Estimates	RN-12	1963
Through Analysis of Discrete Gravity Data		
Gravity Anomalies as Indicators of Groundwater	ETL-CR-73-16	1973
Reserves in Glacial Deposits		
Gravity Correlation Studies for Determination	AD 866 798L	1970
of the Gravity Field of the Earth		
Gravity Study Program, Final Report	ETL-0262	1981
Gravity Study Program, Interim Report	ETL-0253	1981
Ground Target Location Errors Derived From	ETL-0538	1989
Measurements Collected From a Variety of		
Hypothetical Satellite Image Understanding		
Architecture Project, First Annual Report,		
The Sentinel Systems		
Hail and Its Distribution	ETL-SR-73-3	1973
Handbook for Transformation of Datums, Projections,		
Grids and Common Coordinate Systems	TEC-SR-7	1996
Hexagonal Data Base Study	ETL-0338	1983
Hexagonal Data Base Study, Phase II	ETL-0360	1984
High Resolution Optical Power Spectrum Analyzer	ETL-0127	1978
High Resolution Orthophoto Output Table (HIROOT)	AD 856 731L	1969
High Resolution Orthophoto Output Table	ETL-ETR-72-3	1972
High Speed Disc Memory and a Color Image	AD 878 975L	1970
Display for a Small Computer		
High-Speed, Large-Format Film Writer	ETL-0389	1985
Methodologies and Design Study		
High Speed Parallel Sensing Scheme	ETL-0119	1977
History of U.S. Army Engineer Topographic	ETL-SR-74-1	1973
Laboratories (1920 to 1970)		
History Update of the U.S. Army Engineer Topographic		
Laboratories, Fort Belvoir, Virginia, 1984-1988, A	TEC-SR-6	1994
Holographic Compensation of Wavefront Aberrations	ETL-RN-74-11	1975
Holographic Optical Elements With Low Q-Factors	ETL-0123	1977
Holographic Ray Tracing and Spot Diagrams	ETL-0052	1975
Holographic Stereogram Display Techniques for	ETL-CR-74-2	1973
the Viewing and Mensuration of Stereo		
Photogrammetric Imagery		
Holographic Terrain Displays	ETL-0083	1976
Holography and Stereoscopy	ETL-CR-72-2	1972
Horizontal Gradients of Gravity in Geodesy	AD 672 492	1964
Horizontal Gradients of Gravity in S.W. Ohio	AD 672 489	1967

TITLE	REPORT NO.	YEAR
Hot Weather Testing of 10-Second Direction Theodolite with Universal Tribrach and Universal Tripod, Astronomical Attachment, Universal Sun Compass, Lensatic Compass, and Wrist Compass Air Photo Patterns	1289-TR	1953
Hough Transform on the Butterfly and the NCUBE, The	ETL-0438	1986
Hourly and Daily Precipitation Frequencies for the United States	ETL-0498	1988
Hybrid Methodology for Detecting Cartographically Significant Features Using Landsat TM Imagery	ETL-0589	1991
Hyperspectral Gas Analysis System (HyGAS) SBIR Phase I Final Report	TEC-0005	1992
Hyperspectral Image Exploitation SBIR Phase I Final Report	TEC-0004	1992
Hyperspectral Image Exploitation SBIR Phase II Final Report	TEC-0015	1991
Hyperspectral Signatures (400 to 2500 nm) of Vegetation, Minerals, Soils, Rocks, and Cultural Features: I. Laboratory and Field Measurements	ETL-0573	1990
IBIS Query — Software to Support the Image Based Information System (IBIS) Expansion for Mapping, Charting, and Geodesy	ETL-0422	1986
IFSAR Data for Automated Rapid Mapping -- Phase I SBIR	TEC-0073	1995
Image Alignment and Correlation System	ETL-0237	1980
Image-Based Approach to Mapping, Charting, and Geodesy	ETL-0366	1982
Image Correlation on a Parallel Processor	ETL-0061	1976
Image Enhancement by Chemical Intensification	ETL-0014	1975
Image Processing for Visual Navigation of Roadways	ETL-0406	1985
Image-Processing Precision and Affecting Relative Orientation	ETL-RN-71-6	1971
Image Scanner Technology Study	ETL-0137	1978
Image Tube Validation Study	ETL-CR-70-5	1970
Image Understanding Architecture Final Report	TEC-0029	1991
Image Understanding Architecture Project, First Annual Report, The	ETL-0499	1988
Image Understanding Architecture Project, Second Annual Report, The	ETL-0542	1989
Image Understanding Architecture Prototype Evaluation and Development	TEC-0044	1993
Image Understanding Environment for DARPA Supported Research and Applications, First Annual Report	TEC-0017	1991

TITLE	REPORT NO.	YEAR
Image Understanding Environment for DARPA Supported Research and Applications, Second Annual Report	TEC-0021	1992
Image Understanding Environment for ARPA Supported Research and Applications	TEC-0078	1996
Implications of Symbol Usage on U.S. Army Maps for an Automated Cartographic System	AD 667 979	1968
Implications of Symbol Usage on U.S. Army Maps for an Automated Cartographic System, Appendix	AD 667 986	1968
Improvement Program Automatic Map Compilation System	AD 442 522	1964
Improving Classification Accuracy of Radar Images Using a Multiple-Stage Classifier	ETL-0502	1988
Inertial Platform Subsystem for Army Artillery Inertial Survey System (GEISHA)	AD 681 931	1962
Inertial Positioning System Test Data Summary Report	ETL-0028	1975
Inertial Survey Applications to Civil Works	ETL-0309	1983
Inertial Survey Equipment (GEISHA)	AD 814 051	1963
Inferential Techniques for Soil Depth Determinations, Part I: Coleogyne ramossissima Torr. (Black-Brush)	ETL-0036	1975
Inferential Techniques for Soil Depth Determinations, Part II: Artemisia filifolia Torr. (Sand Sagebrush)	ETL-0176	1979
Influence of Atmospheric Refraction on Directions Measured to and from a Satellite, The	RN-10	1963
Instrument for Measuring Absolute Acceleration of Gravity	RN-17	1966
Instrument to Measure the Tilt of Large Structures, An	ETL-0313	1983
Instrumentation for Color Aerial Photography	ETL-RN-70-1	1970
Integration of Artificial Intelligence Concepts into the Methods for Extracting Line Objects from Monochromatic Aerial Imagery	ETL-0425	1986
Intelligent Advisors for Cross-Country Route Planning	ETL-0365	1984
Intelligent TDA Systems Using Neural Networks Phase I Final Report	TEC-0007	1992
Interactive Digital Correlation Techniques for Automatic Compilation of Elevation Data	ETL-0272	1981
Interactive Digital Image Processing for Terrain Data Extraction	ETL-0241	1980
Interactive Digital Image Processing for Terrain Data Extraction, Phase 2	ETL-0277	1981
Interactive Digital Image Processing for Terrain Data Extraction, Phase 3	ETL-0294	1982

TITLE	REPORT NO.	YEAR
Interactive Digital Image Processing for Terrain Data Extraction, Phase 4	ETL-0348	1983
Interactive Digital Image Processing for Terrain Data Extraction, Phase 5	ETL-0374	1984
Interactive Digital Image Processing Investigation	ETL-0172	1978
Interactive Digital Image Processing Investigation, Phase II	ETL-0221	1980
Interactive Image Analysis System Design	ETL-0312	1982
Interactive Knowledge-Based Cartographic Feature Extraction	ETL-0273	1981
Interagency Energy and Environmental Survey		1977
Interferometer Data Reduction Study	AD 503 143L	1969
Interim Solution Rectifier Van	1355-TR	1954
Interim Technical Progress Report, Ninth SemiAnnual Technical Report, Sep 1971-Mar 1972, Project THEMIS, A Center for Remote Sensing	ETL-CR-72-4	1972
Interpolation of Deflections from Horizontal Gravity Gradients	AD 672 490	1967
Interpolation of Gravity Anomalies and Deflection of the Vertical Components from Rapid Gravity Survey System Data	ETL-0075	1976
Interpretation of Radar Imagery for Terrain Analysis in Tropical Environments		1968
Introduction to the Terrain Effects on the Intelligence Preparation of the Battlefield (IPB)	ETL-0481	1987
Inverse Perspective of a Road from a Single Image	ETL-0429	1986
Inverse Scattering Applications in Determining Terrain Feature Parameters	ETL-0279	1981
Investigation and Evaluation of Planigon Lens Distortion Characteristics	1472-TR	1957
Investigation, Experiments, and Study of Electron Beam Recorder (EBR) Techniques for Map Production	ETL-CR-73-15	1973
Investigation of Bjerhammar's New Gravity Reduction Method	AD 460 404	1964
Investigation of Cartographic Pressplate Recording from Digital Data	ETL-0043	1976
Investigation of Continuous Photoconductive Layer Arrays	ETL-0011	1975
Investigation of Discrete Function Technology for Topographic Sciences	ETL-0162	1978
Investigation of Electro-Acoustic Technology for Topographic Application	ETL-0160	1978
Investigation of Extrema in Digital Images for Texture Analysis	ETL-0210	1979

TITLE	REPORT NO.	YEAR
Investigation of Fusion and Fixation Disparity Limits for Photogrammetry	AD 625 217	1965
Investigation of Linear Transformations for Automatic Cartographic Analysis	ETL-0181	1979
Investigation of Multiband Photographic Techniques, Vol. I	AD 479 300L	1965
Investigation of Photographic Mapping Detail and Data Encoding	AD 286 715	1962
Investigation of Techniques to Generate Contours from Stereo Pairs	ETL-0029	1975
Investigation of the Application of "Array Algebra" to Terrain Modeling	ETL-0141	1978
Investigation of the Electronic Distance Measuring Equipment Electrotape	AD 460 401L	1964
Investigation of the Geometrical Quality of the Relative and Absolute Orientation Procedures and the Final Results of the Photogrammetric Procedure	RN-6	1962
Investigation of the Real-Time Accuracy of the DGPS Method	TEC-0024	1992
Investigations into the Problems of Relative Orientation in Stereo Aerial Photogrammetry	AD 452 686L	1964
Investigations of Basic Geometric Quality of Aerial Photographs and Some Related Problems	RN-4	1962
Investigations of the Use of Conventional Films in the ETL Cartographic EBR	ETL-0177	1979
Investigations Related to the Establishment of a World Geodetic System	AD 697 163	1969
IRS: A Simulator for Autonomous Land Vehicle Navigation	ETL-0455	1987
Joint Analyses in Glen Canyon National Recreational Area	ETL-0073	1976
Kalman Filtering and Smoothing in Fotonap for Orbit Determination using GPS Measurements	ETL-0161	1978
KANDIDATS	ETL-CR-71-3	1971
Knowledge-Based Analysis of Scene Dynamics for Target Motion Detection, Recognition, and Tracking	ETL-0486	1987
Knowledge-Based Analysis of Scene Dynamics for Target Motion Detection, Recognition and Tracking, Second Annual Report	ETL-0525	1989
Knowledge-Based Images Analysis	ETL-0258	1981
Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program, Final Report	TEC-0022	1991
Knowledge-Based Vision Techniques (March 1985 - March 1986)	ETL-0431	1986

TITLE	REPORT NO.	YEAR
Knowledge-Based Vision Techniques (March 1986 - March 1987)	ETL-0487	1987
Knowledge-Based Vision Techniques: Obstacle Detection and Avoidance, Fourth Annual Report	ETL-0536	1989
Knowledge-Based Vision Techniques, Third Annual Report	ETL-0521	1988
Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program	ETL-0439	1986
Knowledge-Based Vision Techniques for the Autonomous Land Vehicle (ALV) Program, Second Annual Report	ETL-0507	1988
Knowledge-Based Vision Techniques for the Autonomous Land Vehicle (ALV) Program, Third Annual Report	ETL-0512	1988
Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program Fourth Annual Report	ETL-0582	1990
Knowledge-Based Vision Techniques - Task B: Terrain and Object Modeling Recognition Executive Summary	ETL-0557	1990
Knowledge-Based Vision Techniques — Task B: Terrain and Object Modeling Recognition (March 13, 1985 - March 13, 1986)	ETL-0428	1986
Knowledge-Based Vision Techniques — Task B: Terrain and Object Modeling Recognition (March 13, 1986 - April 27, 1987)	ETL-0485	1987
Knowledge-Based Vision Techniques Task B: Terrain and Object Modeling Recognition, Third Annual Report	ETL-0535	1989
Knowledge-Based Vision Techniques Task B: Terrain and Object Modeling Recognition - Volume I: Autonomous Systems for Navigation and Terrain Recognition	ETL-0558	1990
Knowledge-Based Vision Techniques Task B: Terrain and Object Modeling Recognition - Volume II: Tech Base Vision Research	ETL-0559	1990
Knowledge-Based Vision Techniques Task B: Terrain and Object Modeling Recognition - Volume III: Image Understanding Software Environments	ETL-0560	1990
KT2 Gyro-Theodolite (Otto Fennel GMBH & Co)	57-TR	1970
Land Cover Classification from LANDSAT Data: Phase III of a Joint OCE/NASA Demonstration	ETL-0175	1979
Landforms of Granitic Rocks: An Annotated Bibliography, The	ETL-0566	1990

TITLE	REPORT NO.	YEAR
LANDSAT and DMA Elevation Study	ETL-0386	1984
LANDSAT D: Corps of Engineers Interface with Advanced NASA Ground Systems Study	ETL-0151	1978
LASS-II Rapid Geodetic Survey System (RGSS)	ETL-0518	1986
Light, Target for Ranging Pole	1402-TR	1955
Lightweight North-Seeking Gyro Azimuth Surveying Instrument, Model 11NG531A	AD 486 317	1965
Lightweight North-Seeking Gyro Azimuth Surveying Instrument, Model 11NG531B	AD 844 011L	1968
Linear Feature Extraction from Radar Imagery	ETL-0405	1985
Linear Feature Extraction from Radar Imagery, SBIR Phase II Base Contract	ETL-0469	1987
Linear Feature Extraction From Radar Imagery: SBIR Phase II, Option I	ETL-0497	1988
Linear Feature Extraction From Radar Imagery: SBIR Phase II, Option II	ETL-0530	1988
L.N.K. Software Systems for Transferring, Merging, and Displaying DFAD/DTED Data on AMS/CAPIR	ETL-0318	1983
Local Gravity Field Modeling	ETL-0448	1986
Long Range Survey System	AD 356 441L	1964
Long Range Surveying System	AD 328 203	1960
Low Cost Gyrocompass	ETL-0355	1984
Low Intensity Conflict Viewer (LIC-VIEW) Phase I	TEC-0043	1992
Low Light Level Photography	32-TR	1966
Manual and Automated Line Generalization and Feature Displacement	ETL-0359	1984
Manual for Maintenance and Operation of the MB-1 Multiband Aerial Camera	ETL-0040	1976
Manual of Environmental Effects, Central America	TEC-SR-2	1992
Manual of Environmental Effects, The Countries of Former Yugoslavia and Albania	TEC-SR-5	1993
Manual of Environmental Effects, The Horn of Africa	TEC-SR-4	1992
Map Coating Concept Studies	AD 679 215	1968
Map Illuminator Test, Phase I	ETL-0034	1975
MAPCON Design Study	AD 854 619L	1967
Mapping Camera Image Errors Due to Star Camera Identification and Measuring Errors	ETL-RN-73-1	1973
Mapping from Airborne Radar Scope Presentations		1958
Mapping from Radar Presentations, Second Interim Report	1397-TR	1955
Mapping from Side-Looking Radar	AD 392 041L	1968
Mapping with Minimum Ground Control	1483-TR	1957
MAT Transponder Model No. 10002	AD 721 638	1967

TITLE	REPORT NO.	YEAR
Materials Research for Holographic Recording (Report No. 1, Multiple Image Storage of Continuous Tone Data in Volume Holograms)	ETL-0088	1976
Materials Research for Holographic Recording (Report No. 2, Bleaching Methods for Photographically Recorded Holograms)	ETL-0156	1978
Materials Research for Holographic Recording (Report No. 3, Hardened Gelatin Holographic Recording Materials)	ETL-0197	1979
Mathematical Analysis of a Technique for the Calibration of a Synthetic Aperture Radar, A	43-TR	1968
Mathematical Method for Inversion in Atmospheric Remote Sensing, A	ETL-0346	1983
Mathematical Techniques for Automated Cartography	ETL-CR-73-4	1973
Mathematics of Geodetic SECOR Data Processing	AD 721 837	1964
Matrix Evaluation of Remote Sensor Capabilities for Military Geographic Information (MGI)	ETL-TR-72-6	1972
MATS Performance with the SECOR System	AD 721 635	no date
MATS Transponder	AD 721 634	1966
Measurement of the Change in the Deflection of of the Vertical with a Schuler-Tuned North-Slaved Inertial System	ETL-0138	1977
Measurement Techniques of Electrical Parameters of Surface Materials in the X-Band Region	ETL-0304	1982
Mechanization Design, Performance Simulations, and Cost Trade-Offs Hybrid INS/GPS/PLRS Positioning and Orientation Systems	ETL-0409	1985
Mensuration and Reduction Accuracy and Precision Standard Applicable to an Integrated World-Wide Topographic System	58-TR	1970
Methodological Preliminaries to the Development of an Expert System for Aerial Photo Interpretation	ETL-0342	1984
Methodology for Military Geographic Analysis, A	36-TR	1967
Methods and Results of Remote Barometric Altimetry and Views on the Estimation of Meteorological Field Variables	ETL-RN-73-3	1973
Methods for Calculating Atmospheric Refraction and Its Perturbation	ETL-0299	1982
Methods of Monitoring the Persian Gulf Oil Spill Using Digital and Hardcopy Multiband Data	TEC-0014	1992
Micromap Camera for Display Systems	ETL-ETR-71-5	1971
Microreduction and Enlargement of Graphic Information Study (MEGIS)	ETL-0063	1977
Microwave Pointing Variations and Angle Measurements	26-TR	1966

TITLE	REPORT NO.	YEAR
Military Applications of Multiband Aerial Photography (Report No. 5 in the ETL Series on Remote Sensing)	ETL-0030	1975
Military Geographic Intelligence Products Associated with the SLAR Topo Map Test in Panama	ETL-ETR-70-10	1970
Military Potential Test of Selected Items of Hydrologic Survey Equipment	AD 890 746	1971
Military Significance of the USAETL Research Note "A New Solution for the Anomalous Gravity Potential Resulting from a Modification of Molodensky's Linear Approximation, Its Practical Significance and Numerous Ramifications", The	RN-34	1970
Miniaturized Gyrocompass	ETL-0289	1982
Miniaturized Gyrocompass (Small North-Orienting Device)	ETL-ETR-70-11	1970
Minipim-MK II Precision Indicator of the Meridian (British Aircraft Corp.)	45-TR	1969
Mini Raster-to-Vector Conversion	ETL-0269	1981
Mod II Power Supply for Army Artillery Inertial Survey System (GEISHA)	AD 814 067	1963
Modeling and Contouring Irregular Surfaces Subject to Constraints	ETL-CR-74-19	1975
Modes of Satellite Triangulation Adjustment, Vol. I	AD 633 863	1966
Modes of Satellite Triangulation Adjustment, Vol. II	AD 633 864	1966
Modification of a Cartographic Mapping Camera from Type T-11 to Type KC-4B (with Automatic Exposure Control)	ETL-TR-71-1	1971
Modification of the MUSAT Aerotriangulation Programs to Accommodate Bathymetric Image Points	ETL-0306	1983
Modifications to FOTONAP	ETL-0116	1977
Mono Versus Stereo Analytical Photogrammetry, Part 1	AD 664 184	1967
Mono Versus Stereo Analytical Photogrammetry, Part 2	AD 828 750	1968
Morphometry of Landforms: Quantification of Slope Gradients in Glaciated Terrain	ETL-RN-72-3	1972
Motion Analysis and Object Recognition for Autonomous Navigation	TEC-0020	1991
Multi-Altitude Transponder — Volume I, Schematic Diagrams	AD 721 636	no date
Multi-Altitude Transponder — Volume II, Part 1, Test Procedures and Results of Test MATS Transponder	AD 721 628	no date

TITLE	REPORT NO.	YEAR
Multi-Altitude Transponder — Volume II, Part 2	AD 721 629	1967
Multi-Altitude Transponder — Volume II, Part 3	AD 721 630	1967
Multi-Altitude Transponder — Volume II, Part 4	AD 721 631	no date
Multi-Altitude Transponder — Volume II, Part 5	AD 721 632	no date
Multi-Altitude Transponder — Volume III, Final Reliability Report	AD 721 637	1967
Multi-Altitude Transponder — Volume IV, Design Considerations and Component Selection Criteria	AD 721 633	no date
Multi-Image Correlation Systems Study for MGI	AD 841 079	1968
Multi-Image Correlation Systems Study, Quantitative Evaluation of Electronic Multi-Image Processor	AD 870 453	1969
Multi-Image Pattern Recognition: Ideas and Results	AD 863 596	no date
Multi-Parametric Figures of Equilibrium: Curvature of the Plumb Line	AD 603 073	1964
Multi-Parametric Theory of Spheroidal Equilibrium Figures and the Normal-Spheroids of Earth and Moon		1966
Multispectral Image Maps from Landsat Thematic Mapper Data	ETL-0590	1991
Multiple Camera Analytical Triangulation Program		1965
Multiple Station Analytical Triangulation Program	AD 638 750	1965
Multisensor Approaches for Determining Deflections of the Vertical	ETL-0314	1983
Multisensor Study of Plant Communities at Horsefly Mountain, Oregon	AD 698 098	1969
Multisource Image Analysis	ETL-0208	1979
Multispectral Capability of H&W Film (Photographic Technology Series)	ETL-0101	1977
Multispectral Target Signatures	ETL-0165	1978
Multivariate Spectral Analysis to Extract Materials from Multispectral Data	TEC-0039	1993
MUSAT IV	ETL-CR-70-6	1970
Natural Image Computers, Vol. I	AD 856 137L	1967
Natural Image Computers, Vol. II	AD 856 138L	1967
Near-Real-Time Application of Digital Terrain Data in a Minicomputer Environment	ETL-0142	1978
Near-Surface Bathymetry System (Report No. 11 in the ETL Series on Remote Sensing)	ETL-0163	1978
Neural Networks for Object Detection Using All-Source Imagery	ETL-0585	1991

TITLE	REPORT NO.	YEAR
New Analyses and Methods Leading to Improved Target Acquisition Requirements Involving Systems, Geodetic and Reentry Errors, and Increased Weapons Effectiveness for Conventional Weapons (Part I)	RN-35	1970
New Analyses and Methods Leading to Improved Acquisition Requirements Involving Systems, Geodetic and Reentry Errors, and Increased Weapons Effectiveness for Conventional Weapons (Part II)	ETL-RN-70-3	1970
New Analytical Methods for Simulation/ Estimation of Asymmetric Satellite Dynamics	ETL-CR-73-21	1973
New Formulas Useful When Changing Ellipsoidal Parameters or Orientation	RN-2	1962
New Insights and Results Regarding L.F. Richardson's Turbulence Criterion	ETL-RN-72-2	1972
New Large-Scale, High-Resolution, Multicolor Software Display Concept, A	ETL-0388	1985
New Method for Determining Azimuth and Latitude Independent of Time and Zenith Distance	RN-17	1966
New Methods of Change Detection Using Multispectral Data	ETL-0586	1991
New Solution for the Anomalous Gravity Potential Resulting from a Modification of Molodensky's Linear Approximation, Its Practical Significance and Numerous Ramifications, A	RN-33	1970
1986 Year End Report for Road Following at Carnegie -Mellon	ETL-0464	1987
1987 Year End Report for Road Following at Carnegie-Mellon	ETL-0514	1988
1988 Year End Report for Road Following at Carnegie-Mellon	ETL-0537	1989
Noise Removal on Radar Imagery Using Local Gradient and Statistics	ETL-0402	1985
Noncontact Array Velocimeter	ETL-0077	1976
Non-COTS Displays: The Display Technology of the Future	TEC-0054	1994
North-Seeking Gyrocompass, Final Technical Report	ETL-0251	1980
Observations on Multi-Peg Towers of Hanoi	ETL-0476	1986
Occurrence of Ice in the Form of Glaze, Rime, and Hoar-Frost with Respect to the Operation and Storage of V/STOL Aircraft	ETL-SR-73-1	1973
On Computing Histograms of Images in Log η Time Using Fat Pyramids	ETL-0454	1987

TITLE	REPORT NO.	YEAR
On the Energy Integral for Satellites	RN-29	1968
On the Thermal Nature and Sensing of Snow-Covered Arctic Terrain	ETL-RN-73-4	1973
Optical-Electronic Precision Pointing System	AD 883 021	1965
Optical Power Spectral Analysis for Machine-Readable Factor Maps	ETL-0212	1980
Optical Power Spectrum Analysis (OPSA) (Report No. 1 Recording Optical Spectrum Analyzer System Hardware)	ETL-TR-74-11	1975
Optical Theodolite Readout	AD 821 660L	1967
Optimized Digital Automatic Map Compilation System		
1st Interim Report	AD 412 798	1963
2nd Interim Report	AD 422 227	1963
3rd Interim Report	AD 432 243	1963
4th Interim Report	AD 600 117	1964
Optimized Method for the Derivation of the Deflection of the Vertical from RGSS Data	ETL-0122	1977
Optimized Post-Mission Determination of the Deflection of the Vertical Using RGSS Data	ETL-0164	1978
Orthographic Radar Restitutor Engineer Design Test	ETL-ETR-74-6	1974
Orthophoto Viewer and Transfer Device	AD 722 788	1965
Overview of Vision-Based Navigation for Autonomous Land Vehicles 1986, An	ETL-0479	1987
Parallel Algorithms for Computer Vision	ETL-0456	1987
Parallel Algorithms for Computer Vision, Second Year Report	ETL-0495	1988
Parallel Algorithms for Computer Vision, Third Year Report	ETL-0528	1989
Parallel Algorithms for Computer Vision, Final Report	ETL-0564	1990
Parallel Optical Processing to Convert Elevation Data to Slope Maps. Phase I: Theoretical Analysis	ETL-RN-74-9	1974
Parallel Optical Processing to Convert Elevation Data to Slope Maps. Phase II: Practical Considerations	ETL-RN-74-12	1975
Parallel Profile Plots for Visual Terrain Display	ETL-0115	1977
Parallel Vision Algorithm Design and Implementation, 1987 End of Year Report	ETL-0513	1988
Parallel Vision Algorithm Design and Implementation, 1988 End of Year Report	ETL-0541	1989
Parallel Vision Algorithms, First Annual Technical Report	ETL-0488	1987

TITLE	REPORT NO.	YEAR
Parallel Vision Algorithms, Second Annual Technical Report	ETL-0529	1989
Parser for the ISO 8211 Data Format, A	TEC-0045	1994
Particulate Matter Considerations in the Design of V/STOL Aircraft	ETL-SR-72-2	1972
Passive Recovery of Scene Geometry for an Unmanned Ground Vehicle	TEC-0033	1993
Passive Recovery of Scene Geometry for an Unmanned Ground Vehicle, Second Annual Report	TEC-0053	1994
Passive Recovery of Scene Geometry for an Unmanned Ground Vehicle	TEC-0069	1995
Pattern Classification Techniques Applied to High Resolution, Synthetic Aperture Radar Imagery	ETL-0443	1986
PDEF: A Standard File Format for Data Interchange	ETL-SR-7	1991
Perception for Outdoor Navigation - First Year Report	ETL-0581	1990
Performance Evaluation of the Position and Azimuth Determining System (PADS) with an Improved Vertical Accelerometer	ETL-0166	1978
Personal Navigation and Reporting - Phase I	TEC-0036	1993
Personal Navigation and Reporting - Phase I	TEC-0037	1993
Personal Navigation and Reporting - Phase II	TEC-0083	1996
Phoenix Laser and Terrain Profile Test		1966
Photo Analysis of a Desert Area	ETL-0068	1976
Photo-Geomorphology of Coastal Landforms, Cat Island, Bahamas (Vol. II)	ETL-SR-74-5	1974
Photogrammetric and Tracking Network Analysis Program	ETL-CR-73-17	1973
Photogrammetric and Tracking Network Analysis Program for the UNIVAC 1108 Computer	ETL-0018	1975
Photogrammetric Applications to Field Artillery	56-TR	1970
Photogrammetric Aspects of the Heterodyne Optical Correlator	ETL-0095	1976
Photogrammetric Flash Triangulation for Corps of Engineers Field Use		
1st Interim Report		1960
2nd Interim Report	AD 265 036	1961
3rd Interim Report	AD 271 438	1961
Final Report	AD 271 439	1961
Photogrammetric Reduction for ATL	AD 223 674	1961
Photographic Visibility of Light Images on Aerial Film		1966
Photomap Reproduction System	AD 882 566L	1965
Physical Characteristics of Some Soils from the Middle East	TEC-0032	1993

TITLE	REPORT NO.	YEAR
Pilot Program of Lunar Photography for Precise Selenodesy	AD 452 237	1964
Plastic-Scribing Color Separation for Military Cartography	1485-TR	1957
Platform Orientation System Test Program	ETL-0100	1976
Point Light Source Contact Printer Photographic Technology Series	ETL-0084	1976
Position and Azimuth Determining System (PADS)	ETL-ETR-74-1	1974
Position and Azimuth Determining System (PADS) Helicopter Study	ETL-0009	1975
Position and Surveying System (PASS)	ETL-CR-73-11	1973
Possibility of Adapting a Land Navigation System to Perform Artillery Survey	ETL-0078	1976
Post-Mission Smoothing and Analysis of the Measurements of the Change in the Deflection of the Vertical Obtained by the Rapid Geodetic Survey System (RGSS) at the White Sands Test Range	ETL-0065	1976
Potential of Thermal IR Imagery for Supplemental Map Information in Snow-Covered Areas	ETL-0059	1976
Potential Sand and Dust Source Areas	ETL-SR-72-1	1972
Practical Field Accuracy Limits for a Wild T-2 Theodolite	30-TR	1966
Practical Second-Order Theory for the Disturbance Potential and Deflections of the Vertical, Including an Analysis of the Limitations of the Molodensky/Brovar Series and Downward Continuation of Gravity	ETL-RN-71-1	1971
Practical Tests of the Theoretical Accuracy of Aerial Triangulation	RN-1	1962
Precise Photogrammetric Orientation and Data Determination of HIRAN Mapping System AN/APQ 73	AD 238 857	1960
Precision Enlarging Printer (4X)	27-TR	1966
Precision 2.0X Enlarging Printer	55-TR	1970
Precision 3.3X Enlarging Printer	ETL-ETR-71-3	1971
Precision STARAN Correlator	ETL-0133	1977
Predesign Data for the Radar Stereo Equipment Program	AD 701 169	1969
Preliminary Image Data Extraction Experiments with the Phase I, Automated Image Data Extraction System-I	ETL-RN-74-7	1974
Preliminary Radar Feature Extraction and Recognition Using Texture Measurement	ETL-0315	1983
Preliminary Reliability Prediction — MATS	AD 721 639	1965

TITLE	REPORT NO.	YEAR
Preliminary Study into the Principles of Continuous Tone Electrophotography	AD 401 863	1962
Preproduction Model Cartographic EBR System	ETL-0246	1980
Proceedings of the International Symposium Figure of the Earth and Refraction	AD 825 792	1967
Product Improvement Test Report of Astronomic Surveying Equipment	28-TR	1966
Production of Dense Range Images with the CVL Light-Stripe Range Scanner	ETL-0491	1988
Program and Test Procedures to Determine the Geocentric Coordinates and Orbital Parameters of an Unidentified Satellite	AD 617 698	1968
Program Maintenance Manual for the Reference Scene Software (RSS)	ETL-0067	1976
Programmer for Army Artillery Inertial Survey System (GEISHA)	AD 814 065	1963
Programming Environment for Parallel Vision Algorithms, A (February 1985 - February 1986)	ETL-0433	1986
Programming Environment for Parallel Vision Algorithms, A (February 1986 - February 1987)	ETL-0457	1987
Programming Environment for Parallel Vision Algorithms, A - Final Technical Report	ETL-0563	1990
Programming Environment for Parallel Vision Algorithms, Third Annual Report, A	ETL-0510	1988
Project Ostrich A Feasibility Study: Detecting Buried Mines in Dry Soils Using Synthetic Aperture Radar	TEC-0040	1993
Project SAND — Availability of Construction Materials in the Mekong Delta	Tech Memo 156-1	1968
Project SAND (Phase III) — Analysis of Remote Sensor Imagery of Selected Areas in the Mississippi Delta	ETL-TR-71-3	1971
Project THEMIS: A Center for Remote Sensing		
Study Plan	AD 690 361	1968
Progress Report	AD 847 276	1968
Interim Report	AD 683 584	1968
Progress Report	AD 853 884	1969
Progress Report	AD 864 859	1969
5th Semi-annual Report	AD 869 511	1970
6th Semi-annual Report	AD 879 981L	1970
7th Semi-annual Report (ETL-CR-71-7)	AD 726 966	1971
8th Semi-annual Report (ETL-CR-71-21)	AD 735 752	1971
Final Report (ETL-CR-74-10)	AD A003 266	1974
Propagation of Very Short Radio Waves Through the Ionosphere and the Investigation of Ionospheric Models	ETL-RN-74-1	1973

TITLE	REPORT NO.	YEAR
Proposed Stereophotogrammetric System for Topographic Mapping from Photography Taken at Altitudes up to 100,000 Ft, A	1518-TR	1958
Prototype Automatic Mosaicking System	17-TR	1963
Prototype Electrostatic Image Reproducer	ETL-0035	1973
Prototype Image Spectrum Analyzer (PISA) for Cartographic Feature Extraction	ETL-0204	1979
Prototype Lithographic Enlarging Projection Platemaker	ETL-ETR-72-4	1972
Prototype Stereomat System	4-TR	1962
Quantitative Geography: Achievements and Prospects	ETL-CR-71-12	1971
RACOMS Cartographic Module	ETL-ETR-70-3	1970
RACOMS Compilation Module I	ETL-ETR-70-1	1970
RACOMS Data Processing Module	ETL-ETR-70-4	1970
RACOMS Image Processing Module I	47-TR	1969
RACOMS Image Processing Module II	ETL-ETR-70-2	1970
RACOMS Map Revision Module	ETL-ETR-70-5	1970
RACOMS Operations Module	44-TR	1969
RACOMS Pass Point Marking and Measuring Instrument	53-TR	1970
RACOMS Reproduction Module	ETL-ETR-71-1	1971
Radar Backscatter from a Vegetated Terrain: A Discrete Scattering Approach	ETL-0159	1979
Radar Bridge Patterns Extraction and Recognition	ETL-0323	1983
Radar Image Simulation of Seasonally Dependent Reference Scenes	ETL-0188	1979
Radar Image Simulation Project	ETL-0098	1976
Radar Image Simulation Project: Development of a General Simulation Model and an Interactive Simulation Model, and Sample Results	ETL-0047	1976
Radar Image Simulation: Validation of the Point Scattering Model, Volume I	ETL-0117	1977
Radar Image Simulation: Validation of the Point Scattering Model, Volume II	ETL-0118	1977
Radar Image Simulation: Validation of the Point Scattering Method Addendum	ETL-0155	1978
Radar Mapping Beacon Analysis	ETL-CR-73-22	1973
Radar Mapping Test Ranges	AD 231 433	1959
Radar Network Adjustment		1962
Radar Presentation Restitutor		1956
Radar Sketching Device	20-TR	1965
Radar Stereo Equipment Program	AD 732 875	1971

TITLE	REPORT NO.	YEAR
Radar, Thermal Infrared, and Panchromatic Image Collection and Analysis	ETL-0249	1980
Radiative Transfer in One-Dimensional Discretely Stratified Media	ETL-0236	1980
RADIUS: Model-Based Optimization	TEC-0064	1995
RADOT Code for the Tracking of Radar Incident on Trees	ETL-0147	1978
RADOT Code System to Calculate the Radar Return from a Forested Area	ETL-0206	1979
Rainfall Intensities in the Conterminous United States and Hawaii (Supplement 1 to ETL-SR-72-5: Distribution of Mean Monthly Precipitation and Rainfall Intensities)	ETL-SR-74-3	1973
Range Imagery Algorithms for the Detection of Obstacles by Autonomous Vehicles	ETL-0461	1987
Rapid Cartographic Processing System Study	AD 454 086L	1964
Rapid Combat Mapping System Evaluation	ETL-ETR-70-8	1970
Rapid Geodetic Survey System	ETL-0074	1976
Rapid Geodetic Survey System (RGSS) Deflection of the Vertical and Gravity Anomaly Tests at White Sands Missile Range, 1980	ETL-0308	1982
Rapid Gravity Survey System Aided with Supplemental Gravimetric Data	ETL-0113	1977
RC-135A/USQ-28 Category II Test (The Photographic Resolution Capabilities of the KS-78A Camera Subsystem)	TM-69-1	1969
R&D Plan for Army Applications of AI/ROBOTICS	ETL-0296	1982
Recognition of Handprinted Symbols for Computer-Aided Mapping	ETL-CR-71-27	1971
Recording and Scanning Advances in Cartographic EBR Systems	ETL-0265	1981
Reduction and Classification of the Data Base List	AD 817 518	1967
Reduction Procedures for Absolute Direction and Geodetic Azimuths from Optical Observations of Satellites	RN-14	1965
Reflection and Identification Studies Applied to Terrain Imaging Radar	ETL-0331	1983
Refraction in Selected Model Atmospheres	AD 404 465	1964
Registration of a LANDSAT Image to a DTM — An Error Analysis	ETL-0350	1984
Relation Between the Spectrum of Surface Slopes and the Spectrum of Surface Elevations and its Usefulness in the Theory of Electromagnetic Wave Scattering from Rough Surfaces	ETL-RN-70-2	1970
Relational Data Base Management Study	ETL-0136	1978

TITLE	REPORT NO.	YEAR
Relative Mapping Triangulation Program, Vol. I	AD 721 601	1969
Relative Mapping Triangulation Program, Vol. II	AD 721 602	1969
Relative Mapping Triangulation Program, Vol. III	AD 721 603	1969
Relative Mapping Triangulation Program, Vol. IV	AD 721 604	1969
Remote Sensing Field Guide - Desert	ETL-0588	1991
Remote Sensor Image Capabilities for Acquisition of Terrain Information	ETL-0054	1976
Remote Sensor Imagery Analysis for Location of Construction Materials in the Mekong Delta-Project SAND (Phase II)	52-TR	1970
Replacement of Photographic Imagery Equipment (RPIE)	ETL-0038	1976
Report on Atmospheric Obstructions to Visibility: Volume I — Study Results	ETL-0169	1979
Report on Atmospheric Obstructions to Visibility: Volume II — Results of Literature Search	ETL-0170	1979
Representation, Modeling and Recognition of Outdoor Scenes	TEC-0046	1993
Representation, Modeling and Recognition of Outdoor Scenes, Second Annual Report	TEC-0057	1994
Representation, Modeling and Recognition of Outdoor Scenes	TEC-0077	1996
Research and Design of a PROM Coherent Optical Processor	ETL-0219	1980
Research and Development Acceptance Test Report Surveying Instrument: Azimuth, Gyro, Light-weight (Lear Siegler, Inc. Models)	23-TR	1965
Research and Development of a Prototype Laser Point Marking Instrument	AD 673 291	1967
Research in Expert Interactive Cartographic Systems	ETL-0417	1986
Research in Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program (June 1, 1985 - May 31, 1986)	ETL-0444	1986
Research in Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program (June 1, 1986 - May 31, 1987)	ETL-0482	1987
Research in Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program Third Annual Report	ETL-0522	1988
Research in Knowledge-Based Vision Techniques for the Autonomous Land Vehicle Program Final Annual Report	ETL-0545	1989
Research in Model-Based Change Detection and Site Model Updating	TEC-0079	1996
Research in Space Photogrammetry	AD 722 789	1961
Research in Surveying, Mapping and Geodesy	AD 230 066	1959

TITLE	REPORT NO.	YEAR
Research Institute Lectures on Geography	ETL-SR-71-1	1971
Research on Refinement and Interpretation of Gravity Anomaly Computations	AD 831 840	1968
Research Studies Related to Mapping, Geodesy, and Position Determination — Summary Report		1960
Research Studies Related to Mapping, Geodesy, and Position Determination	AD 286 300	1961
Research Studies Related to Mapping, Geodesy, and Position Determination		
Interim Report No. 10	AD 286 297	1961
Interim Report No. 11	AD 286 298	1961
Interim Report No. 13	AD 286 299	1962
Interim Report No. 14	AD 284 969	1962
Interim Report No. 15	AD 298 584	1962
Research Studies Related to Mapping, Geodesy, and Position Determination — Final Report	AD 402 602	1963
Results of Earth Observation Study on STS-31 for Terra Geode	TEC-0009	1992
Results of Space Triangulation Adjustments from Satellite Data	RN-13	1965
Review and Analysis of U.S. Army Geodetic SECOR System and Development	AD 818 483	1962
Review of New Geographic Methods and Techniques, Vol. I	AD 700 151	1969
Review of New Geographic Methods and Techniques, Vol. II	AD 700 176	1969
Review of Photosensitive Materials for Holographic Recordings	ETL-0128	1978
Road Boundary Detection for Autonomous Vehicle Navigation	ETL-0407	1985
Road Detection on Radar Imagery	ETL-0403	1985
Robotic Vehicle Terrain-Navigation Subsystem: Conceptual Design Phase	ETL-0332	1983
Robust Image Understanding - Techniques and Applications - First Annual Report	ETL-0580	1990
Robust Image Understanding - Techniques and Applications - Second Annual Report	TEC-0050	1993
RPIE Symbol Placement Accuracy	ETL-0076	1976
Ruggedized Geodetic SECOR		1964
Ruggedized Geodetic SECOR System	AD 722 642	1967
RWPF Spatial Data Study	ETL-0367	1984
Sand and Dust Considerations in the Design of Military Equipment	ETL-TR-72-7	1972
Satellite Angulateration	RN-16	1965

TITLE	REPORT NO.	YEAR
Satellite Geodesy Based on Stellar Orientation of Lines Between Unknown Stations	RN-32	1969
Satellite Observations of Widespread Fog	ETL-0361	1984
Satellite-to-Satellite Tracking for Orbit Improvement and Determination of a 1° x 1° Gravity Field	ETL-0064	1976
Satellite-to-Satellite Tracking Study for the Global Positioning System (Rotating-Y Configuration)	ETL-SR-74-6	1974
Satellite, U.S. Army Type II, Geodetic, Final Report		
Volume 1	AD 871 283	1963
Volume 2, Appendix, Antenna Patterns	AD 871 284	1964
Volume 3, Appendix, Environmental Test Results	AD 871 285	1964
Scalable Processing for Distributed Simulation and Scene Generation	TEC-0065	1995
Scale Problems in Geographic Research	ETL-CR-71-16	1971
Scattering from a Vegetation Layer with an Irregular Vegetation Soil Boundary	ETL-0270	1981
Scattering of a Code-Modulated Radio Signal and Associated Multipath Range Errors	ETL-0125	1977
Scene Classification Results Using the Max-Min Texture Measure	ETL-0300	1982
Selected Bibliography of Corps of Engineers Remote Sensing Reports	ETL-0126	1977
Selection of Climate Station Data Using Clustering and Triangulated Irregular Network Techniques	TEC-0041	1993
Semiautomatic Coordinate Reader	ETL-ETR-71-4	1971
Semi-Automatic Pass Point Determination Using Digital Techniques	ETL-0051	1975
Sensing Array System with Image Statistics Processing, A	ETL-0297	1983
Sentinel Satellite Positional Precision Derived from the NAVSTAR Global Positioning System	ETL-0544	1989
Sequential Independent Model Block Analytical Triangulation (SIMBAT)	AD 805 606L	1966
Service Tests and Subsequent Modifications and Tests of Compass, Sun, Universal, 0 to 90 Degrees North and South Latitudes, with Case	1422-TR	1955
Shaded Relief Images for Cartographic Applications	ETL-0259	1981
Shape from Projecting a Stripe Pattern	ETL-0453	1987
Side-Looking Radar Data Requirements for Automated Mapping on the UNAMACE	ETL-CR-72-18	1972
Side-Looking Radar Presentation Viewing and Measuring Instrument	22-TR	1965

TITLE	REPORT NO.	YEAR
Signal Signatures of Topographic Features Using Analog Technology	ETL-0185	1979
Simple Analytical Methods for Estimating Short-Term Rainfall	ETL-0441	1986
Simple Computer Database System for UNIX, A	ETL-0494	1988
Simplified Electrostatic Color Printing	ETL-0421	1986
Simulation of a Radar Image for Garden City Test Site	ETL-0007	1975
Single-Lens, Four-Channel Multiband Camera (Report No. 3 in the ETL Series on Remote Sensing)	ETL-ETR-74-4	1974
Single Photo Analysis of Sampled Aerial Imagery	ETL-RN-74-10	1974
Site Model Based Image Registration and Change Detection - First Annual Report on RADIUS Project	TEC-0055	1994
Smart Environmental Monitor Based on Neural Networks and Multi-Spectral Pattern Recognition	TEC-0048	1993
Smart Mapping, Charting and Geodesy Control Generator, Phase I, A	ETL-0458	1987
Smart Mapping, Charting and Geodesy Control Generator, Phase II, A	ETL-0523	1988
Software Conversion of Standard Linear Format (SLF) to Standard Interchange Format (SIF)	ETL-0394	1985
Software System Description for Minefield Site Prediction Expert System	ETL-0449	1987
Solution of the General Analytical Aerotriangulation Problem	AD 202 318	1958
Some Relations Between the Geometrical Quality of Topographic Mapping and Aerial Photogrammetry	RN-7	1962
Sparse Area Stereo Matching Experiment	ETL-0424	1986
Spatial Data Structures for Robotic Vehicle Route Planning	ETL-0520	1988
Spatial Light Modulators: Test and Evaluation	ETL-0192	1979
Spatial Sampling: A Technique for Acquisition of Geographic Data from Aerial Photographs and Maps	ETL-CR-71-11	1971
Spatial Target Location Errors Derived From Measurements Collected From Sixteen Satellite Constellations	ETL-0532	1989
Spectral Reflectivity Data: A Practical Acquisition Procedure	AD 880 049L	1970
Spectral Signatures of Wetlands Plants (350-990nm)	TEC-0068	1995
Spectral/Spatial Resolution Targets for Aerial Imagery (Report No. 1 in the ETL Series on Remote Sensing)	ETL-TR-74-3	1974

TITLE	REPORT NO.	YEAR
Stable Platform Assembly for Army Artillery Inertial Survey System	AD 681 932	1962
Stable Platform Electronics for Army Artillery Inertial Survey System (GEISHA)	AD 681 933	1962
Star Pattern Recognition and Spacecraft Attitude Determination	ETL-0173	1978
Star Pattern Recognition and Spacecraft Attitude Determination, Phase II	ETL-0211	1979
Star Pattern Recognition and Spacecraft Attitude Determination, Final Report	ETL-0260	1981
STARAN Image Processing	ETL-0243	1980
Stars' Position Determined by Combining Micrometric Observation with an Observed Known Star in a Vertical Plane Close to the Meridian	RN-20	1967
State-of-the-Art Assessment of Automatic Name Placement, A	ETL-0427	1986
State-of-the-Art of Slope Mapping	ETL-0060	1976
Statistical Analysis of Geomorphic, Petrographic and Structural Characteristics of the Dartmoor Tors, Southwest England	TEC-0027	1993
Status of Aerial Color Photography in Government Agencies	TB-1	1968
Stereo Analysis of a Specific Digital Model Sampled from Aerial Imagery	ETL-0072	1976
Stereo Radar Analysis	AD 903 321L	1970
Stereo Radar Techniques Study, Phase I, Vol. 1 — Analysis	AD 800 171L	1966
Stereoplotter, Topographic, Projection-Type High Precision	1627-TR	1960
Stereoscopic Terrain Display for Measurement Applications	ETL-0002	1974
Stress Analysis, Study of the M4 Van Expansible and Adapter, Detachable Running Gear	AD 636 445	1966
Structural Analysis from Radar Imagery, Eastern Panamanian Isthmus	AD 715 322	1970
Studies in Zinc Oxide Photoconductivity	AD 673 836	1968
Studies of Gravity in Space According to Bjerhammer	AD 485 687L	1966
Study and Analysis of the Position and Azimuth Determining System (PADS) Field Maintenance Concept	ETL-CR-74-22	1974
Study and Analysis of the Position and Azimuth Determining System (PADS) for Mapping, Charting, and Geodesy Applications	ETL-CR-73-12	1973

TITLE	REPORT NO.	YEAR
Study and Prototype Model Design of a Miniaturized Gyrocompass, Interim	AD 462 322	1964
Study and Prototype Model Design of a Miniaturized Gyrocompass, Final	AD 465 330	1965
Study of a Digital Interface Design for the Quick Response Multicolor Printer (QRMP)	ETL-0327	1983
Study of Army Requirements for Mapping, Charting, and Geodesy/Digital Topographic Data, A	TEC-0085/0085A	1996
Study of Classification and Nomenclature of Vegetation	ETL-0058	1976
Study of Digital Matching of Dissimilar Images	ETL-0248	1980
Study of Environmental Monitoring and Information Systems	ETL-CR-72-1	1972
Study of Knowledge-Based Systems for Photo Interpretation	ETL-0235	1980
Study of Lithographic Fountain Solutions	AD 830 674L	1967
Study of Panoramic-Metric Image Matching for Photogrammetric Instrumentation	AD 474 839L	1965
Study of Potential Application of Holographic Techniques to Mapping (Interim Report)	ETL-CR-70-8	1970
Study of Potential Application of Holographic Techniques to Mapping (Final Report)	ETL-CR-71-17	1971
Study of Raster Metafile Formats	ETL-0363	1984
Study of Solution of a Large System of Linearized Normal Equations and the Inversion of the Associated Coefficient Matrix	AD 676 849	1968
Study of Stereophotogrammetric Systems for Topographic Mapping with Very High Altitude Aerial Photography	1352-TR	1954
Study of Visual Stereoscopic Acuity		1956-1957
Study of the Accuracy of Visual Planimetric Pointings to Photographic Edges with Different Characteristics	ETL-CR-71-19	1971
Study of the Application of Piezoelectric Techniques to a Small North-Orienting Device	AD 486 467L	1966
Study of the Characteristics of the Holographic Stereomodel for Application in Mensuration and Mapping (Part I of Final Report)	ETL-CR-73-14	1973
Study of the Characteristics of the Holographic Stereomodel for Application in Mensuration and Mapping (Part II of Final Report)	ETL-CR-73-14	1973
Study of the Effect of Corona Conditions on Electrostatic Processes	ETL-CR-72-17	1972
Study of the Effects of Nonhomogeneous Target Backgrounds on Photogrammetric Coordinate Measurement	AD 722 790	1969

TITLE	REPORT NO.	YEAR
Study of the Human Visual System in Support of Automated Feature Extraction	ETL-0271	1981
Study of the Impact of the Global Positioning System on Army Survey	ETL-0070	1976
Study of the Interaction of a Positive Corona with Selenium Coatings Relevant to the IFAX Printing Process	ETL-CR-74-7	1974
Study of the Long Range Position Determination System	AD 505 912	1969
Study to Establish a Method of Selecting Input Photographic Material for Automated Compilation Equipment	ETL-CR-71-24	1971
Study to Optimize Performance of the Rapid Geodetic Survey System — Interim Technical Report	ETL-0252	1981
Study to Optimize Performance of the Rapid Geodetic Survey System — Second Interim Technical Report, A	ETL-0264	1981
Study to Optimize Performance of the Rapid Geodetic Survey System — Addendum Report, A	ETL-0321	1983
Subterranean Detection and Analysis (SDA) (U)	TEC-S-0001	1991
Surface Climate of the Arctic Basin	ETL-TR-71-5	1971
Surface Gravity Effects of Subterranean Tunnels	ETL-0069	1976
Surface Materials and Terrain Features of Yuma Proving Ground, Part I Summary Description	ETL-0021	1975
Survey of Digital Image Display Systems (Soft Copy)	ETL-0085	1976
Survey of Digital Image Scanning Systems	ETL-0087	1976
Survey of Display Devices (Hard Copy)	ETL-0086	1976
Survey of Mass Storage Systems	ETL-0082	1975
Surveying Instrument: Azimuth, Gyro, Lightweight (SIAGL) (Lear Siegler, Inc.)	ETL-TR-72-2	1972
Symbolic Model-Based SAR Feature Analysis and Change Detection	TEC-0010	1992
Synthesis Guide for Cross-Country Movement (Report No. 4 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0220	1980
Synthesis Guide for Helicopter Landing Zone and Drop Zone Sites	ETL-0401	1985
Synthesis Guide for Lines of Communication (Report No. 7 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0263	1981
Synthesis Guide for Obstacle Siting (Report No. 9 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0283	1982

TITLE	REPORT NO.	YEAR
Synthesis Guide for River Crossings (Report No. 11 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0344	1983
System Analysis of the Entire Topographic Support System	ETL-0390	1985
System Analysis of the Entire Topographic Support System (TSS), Final Report	ETL-0158-2	1978
System Analysis of the Entire Topographic Support System (TSS), Interim Report	ETL-0158-1	1978
System and Design Study for an Advanced Drum Plotter	ETL-CR-70-3	1970
System for Automated Sight Model Acquisition and Extension - RADIUS, A	TEC-0062	1995
System for Automatic Secure Transmission and Reception of Topographic Information — Maps, Photographs, or Alphanumeric Facsimile — at TV Rates	ETL-CR-71-2	1971
System for Topographic Inquiry — No. 1, Micrographic Subsystem	ETL-ETR-74-2	1974
System for Topographic Inquiry — No. 2, Alphanumeric Subsystem	ETL-0003	1975
System for Topographic Inquiry — No. 3, Alphanumeric Subsystem Data Base Listing	ETL-0004	1975
System for Topographic Inquiry — No. 4, Program Conversion Procedures	ETL-0005	1975
System for Topographic Inquiry — No. 5, Alphanumeric Subsystem Users Guide	ETL-0031	1975
Systematic Correction and Weighing of Analogue Aerial Triangulation Observations and Their Use in Strip and Block Adjustments	AD 476 273L	1965
Systematic Investigations of Geodetic Networks in Space, Interim	AD 482 852L	1966
Systematic Investigations of Geodetic Networks in Space, Final	AD 815 717	1967
Systems Concepts for Military Geographic Intelligence, Vol. I		1967
Tactical/Strategic Point Positioning Study	ETL-0319	1981
Target Location Errors Derived From a Hypothetical Target Tracking System	ETL-0531	1989
Task-Driven Active Vision for Security and Surveillance	TEC-0070	1996
Technical Data on KC-Film, Toners, and Processes	ETL-0224	1980
Technical Report for Automatic Line Follower	ETL-CR-72-18	1972
Techniques to Improve Astronomic Positioning in the Field	ETL-0400	1985

TITLE	REPORT NO.	YEAR
Technology Requirements for Minefield Detection from Space	TEC-0056	1994
Television Display of Topographic Information	ETL-CR-70-7	1970
Television Display of Topographic Information, Phase II	ETL-CR-71-23	1971
Terrain Analysis Procedural Guide for Built-Up Areas (Report No. 13 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0352	1984
Terrain Analysis Procedural Guide for Climate (Report No. 5 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0247	1980
Terrain Analysis Procedural Guide for Drainage and Water Resources (Report No. 8 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0285	1982
Terrain Analysis Procedural Guide for Geology (Report No. 3 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0207	1979
Terrain Analysis Procedural Guide for Railroads (Report No. 10 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0311	1982
Terrain Analysis Procedural Guide for Roads and Related Structures (Report No. 2 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0205	1979
Terrain Analysis Procedural Guide for Soil (Report No. 6 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0254	1981
Terrain Analysis Procedural Guide for Surface Configuration (Report No. 12 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0352	1984
Terrain Analysis Procedural Guide for Vegetation (Report No. 1 in the ETL Series on Guides for Army Terrain Analysts)	ETL-0178	1979
Terrain Analyst Synthesizer Station	ETL-0231	1980
Terrain Analyst Work Station (TAWS): 1AD After Action Report	ETL-0470	1987
Terrain Data of Mount Hayes D-4 Quadrangle, Fort Greely, Alaska (Report No. 4 in the ETL Series on Remote Sensing)	ETL-TR-74-7	1974
Terrain Effects Analysis Routine for an MGI System	ETL-0010	1975
Terrain Eigenvector Dyad Analysis	AD 649 347	1967
Terrain Factor Analysis and Automatic Color Coded Mapping Utilizing the IDECS	ETL-CR-72-13	1972
Terrain Modeling: Shortest Path, Drain Patterns, and Interspersed Contours	TEC-0003	1991

TITLE	REPORT NO.	YEAR
Terrain Visualization for the Portable All-Source Analysis Work Station	TEC-0011	1992
Test and Evaluation of a Baudot-FIELDATA Code Converter, Paper Tape	15-TR	1963
Test and Evaluation of 9 by 18 Rectifier for 12- and 24-inch Focal Length Photography	1460-TR	1956
Test and Evaluation of Target Map Coordinate Locator Equipment	14-TR	1963
Test and Evaluation of the Analytical Photogrammetric Positioning System, Advanced (APPS-II)	ETL-0293	1982
Test and Evaluation of the Direct Viewing Stereoplotter, Wernstedt-Mahan Type	1471-TR	1957
Test and Evaluation of the Headliner, Model 400	1568-TR	1959
Test and Evaluation of the Interim Halcon Mapping System	3-TR	1961
Test and Evaluation of the Interim Stereoplotter, Topographic, Projection-Type, High Precision	1493-TR	1957
Test and Evaluation of the Kelsh Plotter, Model 5000, Manufactured by the Instruments Corp.	1311-TR	1953
Test and Evaluation of the Near Real Time Exploitation System	ETL-0281	1982
Test and Evaluation of the Prototype Side-Looking Radar Presentation Restitutor	29-TR	1966
Test and Evaluation of the Santoni Cartographic Stereomicrometer	1644-TR	1960
Test and Evaluation of the 720 Plotter Manufactured by Bausch and Lomb Optical Co.	1348-TR	1954
Test and Evaluation of the Stereopontometer and Adapted Multiplex	1381-TR	1954
Test and Evaluation of the Stereopontometer with Kelsh-Type Stereoplotters	1425-TR	1955
Test and Evaluation of Ultrasonic Scribing Equipment	1641-TR	1960
Test and Investigation of the Photonymograph (PN-4)	1537-TR	1958
Test of Map-Read Magnetic Declination Accuracy	ETL-148	1978
Test of Reconnaissance Photographic Transposer AN/GSH-1	1566-TR	1959
Test Results of a Singer, Kearfott Division Modified Land Navigation System	ETL-0238	1980
Test Results of the Lear Siegler, Singer and Sperry Gyro Heading Reference Systems	ETL-0288	1982
Test Results of the Litton Low-Cost Semi-Strapped-Down Inertial Land Navigation System	ETL-0202	1979

TITLE	REPORT NO.	YEAR
Test Strategy for High Resolution Image Scanners, A	ETL-0345	1983
Testing and Evaluation of the Shiran System by Advanced Data Reduction Methods	AD 707 418	1969
Testing of an Experimental Viscous-Friction Coupled Small North Orienting Device	AD 822 011	1967
Tests and Evaluation of an Automatic Point Reading, Plotting, and Grid Ruling Machine	8-TR	1962
Tests and Evaluation of an Earth Curvature Correction Device	10-TR	1963
Tests and Evaluation of the AS-11A Stereoplotter	50-TR	1969
Tests and Evaluation of the Zeiss Stereotope Stereoplotting Instrument	1567-TR	1959
Tests and Evaluation of Ultrawide-Angle Mapping Photography	6-TR	1961
Tests and Evaluations of Precision Coordinatographs	1-TR	1961
Tests of Basic Geometrical Qualities of Photogrammetric Plotting Instrument	RN-5	1962
Tests on the Change Detector		1964
Texture Analysis and Cartographic Feature Extraction	ETL-0370	1985
Texture Tone Study — Category Maps, Gradient and Homogeneity Images	ETL-CR-73-10	1973
Texture Tone Study — Classification Experiments	ETL-CR-72-16	1972
Texture Tone Study (Quantizing on the IDECS/PDP)	ETL-CR-72-3	1972
Texture Tone Study: Summary and Evaluation	ETL-0005	1975
Texture Tone Study with Application to Digitized Imagery	TR-182-1	1970
Texture Tone Study with Application to Digitized Imagery (Interim Report)	ETL-CR-71-14	1971
Texture Tone Study with Application to Digitized Imagery (Final Report)	ETL-CR-74-17	1974
Theodolite with Shaft Angle Encoder and Display	AD 662 080	1967
Theoretical and Experimental Study of Wave Scattering from Composite Rough Surfaces	ETL-CR-74-4	1974
Thermal Infrared Spectra of Natural and Man-Made Materials: Implications for Remote Sensing	ETL-0587	
Third-Order Co-Occurrence Texture Analysis Applied to Samples of High Resolution Synthetic Aperture Radar Imagery	ETL-0396	1985
Three Approximate Methods for Estimating the Best Subset of GPS Satellites Position Calculations	ETL-0556	1990
Three-Dimensional Modeling Station, Phase II	TEC-0084	1996
Three-Dimensional Road Structure from Motion Stereo	ETL-0471	1987

TITLE	REPORT NO.	YEAR
Tight Upper Bound for the Speed-Up of Parallel Best-First Branch-and-Bound Algorithms, A	ETL-0462	1987
Topographic Data Output Study	AD 262 161L	1961
Topographic Eigenvector Analysis	AD 484 747L	1966
Topographic Radar Mapping Systems Design Study		1968
Topographic Relaxation Study	ETL-0209	1979
Total Optical Color System (Report No. 2 in the ETL series on Remote Sensing)	ETL-ETR-74-3	1974
Toward Automatic Extraction of Cartographic Features	ETL-0153	1978
TPLOT: A Simple Program for Plotting Percent Composition Data on Ternary Diagrams	ETL-RN-74-2	1973
Training Course on Data Reduction of Radar Topographic Imagery	AD 721 653	1969
Transformation of Coordinates of Cartographic Digital Data	ETL-TR-74-8	1974
Transformations for Dimension Reduction and Expansion of the Discrete Fourier Transform Under Scanning	ETL-RN-74-3	1974
Transforming Printers: Acceptance and Engineering Tests	40-TR	1968
Transitional Design Study of the Position and Azimuth Determining System (PADS)	ETL-0001	1975
Tribrach, Universal	1453-TR	1956
Tripod, Universal, Final Report on Project 8-35-10-107	1413-TR	1955
Two Approaches to a Portable Color-Measuring System	RN-15	1966
Two-Dimensional Path Planning with Obstacles and Shadows	ETL-0452	1987
Two-Way Linear Interpolation	ETL-RN-71-5	1971
Type I Geodetic Satellite	AD 721 652	1964
Typro Composer Photolettering Machine	1504-TR	1957
UMASS RADIUS Project - Year 2, The	TEC-0082	1996
Unified Approach to Mapping, Charting, and Geodesy (MC&G) Data Base Structure Design	ETL-0144	1978
Unified Geodetic Parameter Program (GEOPS), Vol. 1 of 2 — Mathematical Analysis	AD 640 321	1966
Unified Geodetic Parameter Program (GEOPS), Vol. 2 of 2 — Program Description	AD 640 322	1966
Universal Analog Rectification System for Map Revision	24-TR	1965
Universal Automatic Map Compilation Equipment	51-TR	1969
Universal Radar Signal Processor (Correlator), Interim	AD 487 144L	1966

TITLE	REPORT NO.	YEAR
Universal Radar Signal Processor (Correlator), Final	AD 841 545L	1968
Urban Warfare Digital Database SBIR Phase I	TEC-0042	1992
U.S. Army Evaluation of the Electronic Map Data (EMD) Prototype	TEC-0026	1992
U.S. Army Type II Geodetic Satellites, Vol. 1 1965	AD 721 645	
U.S. Army Type II Geodetic Satellites, Vol. 2 1965	AD 721 646	
U.S. Army Type II Geodetic Satellites, Vol. 3 1965	AD 721 647	
Use and Calibration of Distance Measuring Equipment for Precise Mensuration of Dams (Revised)	ETL-0048	1976
Use and Calibration of Distance Measuring Equipment for Precise Mensuration of Dams	ETL-0190	1979
Use of a Vidicon to Digitize Certain Types of Target Image in a Photographic Background	AD 457 818L	1964
Use of Array Algebra in Terrain Modeling Procedures	ETL-0094	1976
Use of Edges of Photographic Images as Specifiers of Image Quality	ETL-CR-72-15	1972
Use of Interim Terrain Data to Populate Project 2851's Database in Support of Ground Forces Simulation	ETL-0591	1991
Use of Radar Images in Terrain Analysis: An Annotated Bibliography	ETL-0024	1975
Use of Side-Looking Airborne Radar (SLAR) Imagery for Engineering Soils Studies	46-TR	1969
User's Guide for the Analytical Photogrammetric Positioning System (APPS), A	ETL-0446	1986
User's Guide to Data Preparation, Photogrammetric Navigation Analysis Program Fotonap	ETL-0174	1978
User's Manual for the Reference Scene Software (RSS)	ETL-0066	1976
Using Terrain Analysis to Predict Likely Minefield Sites	ETL-0325	1983
Utility of Radar Imagery in the Production of Tactical Terrain Data. Military Capabilities Report	ETL-0045	1975
Utilization of a Photogrammetric Facility (PF) in Human Engineering Laboratories Battalion Artillery Test Number Two (HELBAT II)	ETL-SR-71-2	1971
Variscale Stereo Point Marking Instrument	39-TR	1968
Vegetation and Terrain Effects on Digital Classification of LANDSAT Imagery	ETL-0292	1982

TITLE	REPORT NO.	YEAR
Vegetation and Terrain Relationships in South-Central New Mexico and Western Texas	ETL-0245	1980
Vegetation Data Extraction Software Documentation/User's Manual	ETL-0340	1983
Vegetative Cover Effects on Soil Spectral Reflectance	ETL-0284	1982
Vertical Obstruction Study, Final Report	ETL-0358	1984
Video Stream Processors: A Cost-Effective Computational Architecture for Image Processing	ETL-0229	1980
Vision-Based Navigation and Parallel Computing First Annual Report	ETL-0548	1989
Vision-Based Navigation and Recognition	TEC-0047	1994
Vision-Based Navigation and Recognition, Second Annual	TEC-0061	1995
Visual Factors Affecting the Precision of Coordinate Measurement in Aerotriangulation	RN-21	1967
Visual Navigation System for Autonomous Land Vehicles, A	ETL-0408	1985
Vision-Based Navigation and Parallel Computing Second Annual Report	ETL-0572	1990
Vision-Based Navigation for Autonomous Ground Vehicles, Fourth Annual Report	TEC-0028	1992
Vision-Based Navigation for Autonomous Ground Vehicles, 1986 Annual Report	ETL-0432	1986
Vision-Based Navigation for Autonomous Ground Vehicles, First Annual Report	ETL-0509	1988
Vision-Based Navigation for Autonomous Ground Vehicles, Third Annual Report	ETL-0519	1988
Vision-Based Navigation for Autonomous Ground Vehicles, Summary Report	ETL-0543	1989
Voice Interactive Systems Technology (VIST) Research	ETL-0349	1984
Voice Interactive Systems Technology (VIST) Research	ETL-0349	1984
Water Resources Overlays Users Guide	TEC-SR-3	1990
Weather Extremes Around the World (Revision of NLABS Report TR-70-45-ES)	ETL-TR-74-5	1974
Weighted Line-Finding Algorithm	ETL-0200	1979
What is a Hill? An Analysis of the Meaning of Generic Topographic Terms	ETL-0576	1991
Wind Design Criteria for Field Shelters — A Study	ETL-0037	1975
Wire List GEISHA Computer	AD 847 667	1969
World Areas More Humid Than the Canal Zone during the Wet Season (Note 3 of "Studies to Aid TECOM in Analyses of Environmental Risks to Materiel")	ETL-RN-74-8	1974

TITLE	REPORT NO.	YEAR
World Areas with Higher Precipitation Intensities and Frequencies than the Tropic Test Center, Canal Zone	ETL-0022	1975
World Areas with Higher Temperatures than the Yuma Proving Ground During Summer (Note 2 of "Studies to Aid TECOM in Analyses of Environmental Risks to Materiel")	ETL-RN-74-6	1974
World Areas with Lower Temperatures than the Arctic Test Center During Winter (Note 1 of "Studies to Aid TECOM in Analyses of Environmental Risks to Materiel")	ETL-RN-74-5	1974
World Weather Extremes	ETL-0416	1985
Worldwide Distributions of Ambient Temperatures and Temperatures of Materiel Exposed to Direct Solar Radiation	ETL-SR-73-2	1972
Worldwide Distribution of Mean Dewpoint: Surface and Lower Atmosphere	ETL-SR-72-4	1972
Worldwide Distribution of Mean Monthly Dewpoint (Supplement to ETL-SR-72-4 "Worldwide Distributions of Mean Dewpoint: Surface and Lower Atmosphere")	ETL-SR-72-2	1973
Xerox 6500 Color Copier	ETL-0106	1977
Zoom Transfer Scope	ETL-ETR-72-5	1972